# UNITED STATES
# National Residue Program for Meat, Poultry, and Egg Products

# 2011 RESIDUE SAMPLE RESULTS

United States Department of Agriculture
Food Safety and Inspection Service
Office of Public Health Science

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# EXECUTIVE SUMMARY

## 2011 United States National Residue Program Data

The 2011 United States National Residue Program for meat, poultry, and egg products (hereafter the NRP), an interagency chemical testing program administered by the Food Safety and Inspection Service (FSIS), examined food samples for the presence of 128 chemical compounds, including 78 veterinary drugs, 45 pesticides, and 5 environmental contaminants. As described in detail for each chemical compound class within this book, these compounds have been selected because of their potential public health concern. All samples were analyzed at one of three FSIS International Standardization Organization 17025-accredited laboratories: the Eastern Laboratory in Athens, GA; the Midwestern Laboratory in St. Louis, MO; or the Western Laboratory in Alameda, CA.

The NRP domestic sampling program comprises scheduled sampling and inspector-generated sampling. This allows the detection of residues or contaminants in food at concentrations that could adversely affect human health. The levels at which violations occur (e.g., those above an established tolerance) are based on toxicological studies evaluating the potential human health risk from exposure to these residues or contaminants. In 2011, no residues were detected in 99 % of the domestic scheduled samples, and the majority of detected violations were veterinary drugs. Of the 207,449 total samples analyzed, FSIS inspection program personnel (IPP) collected 20,313 samples under the domestic scheduled sampling program and 187,136 samples under the inspector-generated program. The NRP chemical residue methods detected 1,072 total violations: 27 from the scheduled sampling program; 1,040 from the inspector-generated program; and 5 from the U.S. State residue sampling program. The veterinary drug violations were mostly sulfonamides and antibiotics used to prevent or treat bacterial infections. Generally, drug residue violations result from an inadequate withdrawal time for the drugs to clear the animal's system. Detected residues are usually concentrated in kidney and liver tissue rather than in muscle tissue.

Of the 207,449 total samples analyzed, FSIS IPP collected 20,313 samples under the domestic scheduled sampling program. This number represents 60 compounds in 23 animal product classes. Of these 20,313 samples, the domestic scheduled sampling program reported 27 residue violations, accounting for less than 1 % of samples collected. Antibiotics and avermectins accounted for the majority of violations, 8 and 9, respectively. Additionally, the domestic scheduled sampling program identified 155 samples (again, less than 1 %) with non-violative positive residue levels. By definition, a non-violative positive residue sample tests positive when residue presence is detected below the established tolerance. Arsenic comprised the highest percentage of non-violative positives (43% of the 155 non-violative positive samples), followed by tetracycline (18%) and moxidectin (13%). Young chickens, formula-fed veal, and young turkeys had the highest number of positive non-violative results.

The inspector-generated samples are screened in-plant using either the Fast Antimicrobial Screening Test (FAST) or the Kidney Inhibition Swab (KIS™) test and sent to the FSIS Midwestern Laboratory for confirmation or initial analysis. Out of 1,883 non-violative positive samples analyzed under the inspector-generated program, 1,597 (85%) were detected with KIS™ tests, compared to 213 (11%) detected using the FAST screen. The remaining 4% of violations comprise collector-generated samples and samples from show animals and individual states.

For an in-plant screening, the in-plant inspector selects a carcass for sampling based on professional judgment and public health criteria outlined in FSIS Directives 10,800.1 and 10,220.3. Under the inspector-generated program's 187,136 samples, FSIS labs reported 1,333 residue tissue violations in 1,045 (1,040 inspector-generated and 5 from the States) animals (a single animal may have multiple tissue violations) and in-plant personnel reported 1,883 samples as non-violative positives. Neomycin accounted for the highest percentage of non-violative positive samples (421 or 22 %), followed by tetracycline (345 or 18 %) and tulathromycin (212 or 11%). Bob veal, dairy cows, and beef cows had the highest number of positive non-violative results. FAST detected 52 (4%) of 1,333 total inspector-generated violative samples, while 1,237 (93%) of 1,333 violations were detected by the KIS™ test. The remaining 2% of violations comprise collector-generated samples and samples from show animals.

In addition, FSIS plans and administers an import reinspection program as part of the NRP. After U.S. Customs Service and USDA/APHIS requirements are met, shipments imported into the United States must be reinspected by FSIS at an approved import inspection facility. FSIS inspectors carry out reinspection in approximately 117 official import establishments. In 2011, the import sampling program analyzed 121 chemical residues from 13 compound classes of veterinary drugs and pesticides. Of the 2,880 samples analyzed, 16 violations were detected—all from the veterinary drug avermectin.

FSIS continually strives to improve methods for reporting the NRP data. These reports are publicly available on the FSIS Web site. Interested parties may contact the FSIS Chemical Residue Risk Staff at (202) 690-6409 for additional copies of the annual report.

## ACRONYMS

**ADRS –** Animal Disposition Reporting System

**AIIS** – Automated Import Information System

**AMDUCA –** Animal Medicinal Drug Use Clarification Act

**AMS** – Agricultural Marketing Service

**APHIS** – Animal and Plant Health Inspection Service

**ARS –** Agricultural Research Service

**CDC –** Centers for Disease Control and Prevention

**CHCs –** Chlorinated hydrocarbons

**COPs** – Chlorinated organophosphates

**COLLGEN –** Collector-Generated Samples sent directly to the laboratory

**CRRS –** Chemical Residue Risk Staff

**DAIG –** Data Analysis and Integration Group

**DCA –** Desfuroylceftiofur Acetamide

**DCCD –** Desfuroylceftiofur Cysteine Disulfide

**DW –** FSIS Data Warehouse

**FAST –** Fast Antimicrobial Screening Test

**FDA** – U.S. Food and Drug Administration

**FSIS –** Food Safety and Inspection Service

**EPA** – U.S. Environmental Protection Agency

**HACCP –** Hazard Analysis and Critical Control Point

**IPP** – Inspection Program Personnel

**KIS™ Test –** Kidney Inhibition Swab Test

**NASS** – National Agricultural Statistics Service

**ND –** Non-detect

**NRP** – National Residue Program

**NSAID –** Non-Steroidal Anti-inflammatory Drug

**OCIO –** Office of the Chief Information Officer

**OFO –** Office of Field Operations

**OPHS –** Office of Public Health Science

**PBDE –** Polybrominated diphenyl ethers

**PCBs –** Polychlorinated biphenyls

**PHIS –** Public Health Information System

**PHV –** Public Health Veterinarian

**PPB –** Parts per billion

**PPM –** Parts per million

**RAD –** Risk Assessment Division

**RVIS** – Residue Violation Information System

**SAT –** Surveillance Advisory Team

**STATE –** State or Government Agency Testing

**SHOW –** Show Animals

**TOI –** Type of Inspection

## INTRODUCTION

The 2011 United States National Residue Program (NRP) for meat, poultry, and egg products: residue sample results (referred to as the "Red Book") provides the residue sampling results from testing for chemical compounds in food animals produced domestically or imported into the United States.

The NRP requires the cooperation and collaboration of several agencies for its successful design and implementation. The USDA Food Safety and Inspection Service (FSIS), the Environmental Protection Agency (EPA), and the Department of Health and Human Services' Food and Drug Administration (FDA) are the primary federal agencies managing this program. The FDA, under the Federal Food, Drug, and Cosmetic Act, establishes tolerances or action levels for veterinary drugs, food additives, and environmental contaminants. The EPA, under the Federal Insecticide, Fungicide, and Rodenticide Act (as modified by the Food Quality Protection Act), establishes tolerance levels for registered pesticides. Title 21 Code of Federal Regulations (CFR) includes tolerance levels established by FDA; Title 40 CFR includes tolerance levels established by EPA.

A scheduled sampling program is developed annually by representatives from FSIS, FDA, EPA, the USDA Agricultural Research Service (ARS), the USDA Agricultural Marketing Service (AMS), and the Centers for Disease Control and Prevention (CDC). These agency representatives work together to create the annual sampling plan using NRP results, FDA veterinary drug inventories completed during on-farm visits and information collected during FDA investigations. The agencies establish a relative ranking for the chemicals, determine the production classes of public health concern, and evaluate FSIS laboratory capacity and analytical methods. FSIS publishes the finalized sampling plan in the NRP sampling plans for meat, poultry, and egg products, referred to as the Blue Book.

Chemical compounds tested in the program include approved and unapproved veterinary drugs, pesticides, and environmental contaminants. The NRP is designed to: 1) provide a structured process for identifying and evaluating chemical compounds of concern in food animals; 2) analyze chemical compounds of concern; 3) collect and report results; and 4) identify the need for regulatory follow-up when violative levels of chemical residues are found.

FSIS administers this regulatory program under the Federal Meat Inspection Act (FMIA) (21 U.S.C. 601 et seq.), the Poultry Products Inspection Act (PPIA) (21 U.S.C. 453 et seq.), and the Egg Products Inspection Act (21 U.S.C. 1031 et seq.). The program is designed to protect the health and welfare of consumers by regulating the meat, poultry, and egg products produced in federally inspected establishments and to prevent the distribution in commerce of products that are adulterated or misbranded.

Since 1967, FSIS has administered the NRP by collecting samples from meat, poultry, and egg products and analyzing the samples for specific chemical compounds at one of three FSIS

laboratories. A violation occurs when an FSIS laboratory detects a chemical compound level in excess of an established tolerance or action level. FSIS informs the producer, via certified letter, that an animal from that business has a violative chemical residue. FSIS also shares the violation data with FDA, which has on-farm jurisdiction, and with EPA, for environmental chemicals. FDA and cooperating State agencies investigate producers linked to residue violations, and can enforce legal action.

FSIS posts a weekly Residue Repeat Violator List, identifying producers with more than one violation on a rolling 12-month basis. These lists provide helpful information to processors and producers working to avoid illegal levels of residues, serve as deterrents for violators, and enable FSIS and FDA to make better use of resources. Because FSIS updates this list weekly, FDA may not have investigated each violation at the time of publication.

In the late 1990s, FSIS implemented the Hazard Analysis and Critical Control Point (HACCP) inspection system in all federally inspected establishments. The HACCP regulation (9 CFR 417) requires FSIS-inspected slaughter and processing establishments to identify all food safety hazards reasonably likely to occur before, during, and after entry into the establishment. The regulation also requires that the establishments determine preventive measures to control these hazards. FSIS takes regulatory action against establishments that do not have adequate HACCP controls for preventing chemical residues.

## SAMPLING PLANS OF THE UNITED STATES NATIONAL RESIDUE PROGRAM FOR MEAT, POULTRY, AND EGG PRODUCTS

The NRP sampling plans focus on chemical residues in both domestic meat, poultry, and egg products and import reinspection of meat and poultry products. The domestic sampling plan includes scheduled sampling and inspector-generated sampling. The import reinspection sampling plan encompasses normal sampling, increased sampling, and intensified sampling. For detailed sampling plan instructions, see FSIS Directive 10,800.1, *Procedures for Residue Sampling, Testing, and Other Responsibilities for the National Residue Program*.

## DOMESTIC SAMPLING PLAN: Scheduled Sampling

Scheduled sampling plans involve random tissue sampling from food animals that have passed ante-mortem inspection. The development of scheduled sampling plans proceeds in the following manner: 1) determine chemical compounds of concern to food safety; 2) use algorithms to rank the selected chemical compounds; 3) pair these chemical compounds with appropriate food animal and egg products; and 4) establish the number of samples to be collected.

The Surveillance Advisory Team (SAT), an interagency committee comprising representatives from FSIS, FDA, EPA, AMS, ARS, and CDC, determines the chemical compounds of public health concern and matches these compounds with the appropriate production class (e.g., young chickens, bob veal, steers, etc.). FSIS calculates the number of samples needed for the scheduled sampling. The laboratories test the samples for the presence of chemical residues and report any violative levels. The resulting violation data are used to verify the effectiveness of industry process controls and HACCP plans. FSIS, FDA, and EPA review and make final adjustments to the plan.

The domestic scheduled sampling plan determines the prevalence of chemical residues in the nation's food supply. Sample results are used to:

- guide FSIS decisions to condemn carcasses with violative levels of residues;
- guide FDA regulatory decisions when a sample contains violative levels of residues to determine action against producers; and
- guide industry decisions to recall a product that was not retained while the sample was tested and found to contain violative levels of residue.

## DOMESTIC SAMPLING PLAN: Inspector-Generated Sampling

Inspector-generated sampling is conducted by in-plant Public Health Veterinarians (PHVs), or by a Consumer Safety Inspector (CSI) under the oversight of a PHV, on an animal suspected to have violative levels of chemical residues. Currently, inspector-generated sampling targets *individual suspect animals* and *suspect populations of animals*. When an inspector-generated sample is collected, the carcass is retained pending the results of laboratory testing. If a carcass is found to contain violative levels of residues, the carcass is condemned. FSIS keeps a weekly list of establishments with repeat violations. Click here to access the weekly repeat violator list.

### Sampling for individual suspect animals

The in-plant inspector selects a carcass for sampling based on professional judgment and public health criteria outlined in FSIS Notices and FSIS Directives 10,800.1 and 10,220.3 (i.e., animal disease signs and symptoms, producer history, or results from random scheduled sampling). Some samples are screened in the plant by the CSI and verified when necessary by a PHV. Other samples are sent directly to the laboratory for analysis. For example, if the IIC suspects the misuse of a veterinary drug in an animal, he/she can perform in-plant residue screening test. If the result of a screening test is positive, the PHV may be asked to send the sample to an FSIS laboratory for confirmation.

### Sampling for suspect animal populations

Sampling for suspect animal populations is directed by a FSIS regulation, directive, or notice.

### Actions taken on violations

A violation occurs when an FSIS laboratory detects a residue that exceeds an established tolerance or action level. Once the laboratory analysis is complete, FSIS enters the residue violation into the Residue Violation Information System (RVIS), an FSIS/FDA interagency database. While FSIS has jurisdiction over establishments, FDA has jurisdiction on the farm and may take actions that range in severity from producer education to taking legal action.

## IMPORT REINSPECTION SAMPLING PLAN

Imported meat, poultry, and egg products are sampled through the Port-of-Entry Reinspection Program, a chemical residue-monitoring program conducted to verify the equivalence of inspection systems in exporting countries. All imported products are subject to reinspection and one or more types of inspection (TOI) are conducted on every lot of product before it enters the United States. Chemical residue sampling is included in the reinspection of imported products. The following are the three levels of chemical residue reinspection:

- Normal sampling (random sampling from a lot);
- Increased sampling (above-normal sampling as the result of an Agency management decision); and
- Intensified sampling (when a previous sample for a TOI failed to meet U.S. requirements).

For intensified sampling, the lot must be retained pending laboratory results. The data obtained from laboratory analyses are entered into the Public Health Information System (PHIS), an FSIS database designed to generate reinspection assignments, receive and store results, and compile histories for the performance of foreign establishments certified by the inspection system in the exporting country.

**Estimated Livestock, Poultry, and Egg Products**

Table 1 presents the (number of head slaughtered or pounds of eggs processed), pounds per animal (dressed weight), total pounds (dressed weight), and the percent estimated relative consumption of domestic and exported product for each production class.

**Table 1. 2011 Estimated Consumption Data by Production Class**

| Production Class | Number of Head Slaughtered[1] | Pounds per Animal (dressed weight)[2] | Total Pounds (dressed weight) | Percent Estimated Relative Consumption |
|---|---|---|---|---|
| Bulls | 591,163 | 875 | 517,267,625 | 0.538% |
| Beef cows | 3,808,560 | 607 | 2,311,795,920 | 2.403% |
| Dairy cows | 2,929,315 | 607 | 1,778,094,205 | 1.848% |
| Heifers | 9,726,671 | 768 | 7,470,083,328 | 7.765% |
| Steers | 16,554,157 | 835 | 13,822,721,095 | 14.369% |
| Bob veal | 423,820 | 75 | 31,786,500 | 0.033% |
| Formula-Fed veal | 358,700 | 245 | 87,881,500 | 0.091% |
| Non-formula-Fed veal | 14,652 | 350 | 5,128,200 | 0.005% |
| Heavy calves | 37,647 | 400 | 15,058,800 | 0.016% |
| **Subtotal, Cattle** | **34,444,685** | | **26,039,817,173** | **27.069%** |
| Market hogs | 103,559,259 | 204 | 21,126,088,836 | 21.961% |
| Roaster pigs | 816,135 | 70 | 57,129,450 | 0.059% |
| Boars/Stags | 421,179 | 201 | 84,656,979 | 0.088% |
| Sows | 3,066,998 | 305 | 935,434,390 | 0.972% |
| **Subtotal, Swine** | **107,863,571** | | **22,203,309,655** | **23.081%** |
| Lambs | 1,821,749 | 69 | 125,700,681 | 0.131% |
| Sheep | 138,745 | 65 | 9,018,425 | 0.009% |
| Goats | 582,437 | 50 | 29,121,850 | 0.030% |
| **Subtotal, Ovine** | **2,542,931** | | **163,840,956** | **0.170%** |
| Bison | 44,192 | 607 | 26,824,544 | 0.028% |
| **Total, All Livestock** | **144,895,379** | | **48,433,792,328** | **50.349%** |
| Young chickens | 8,544,135,412 | Not Reported | 37,303,662,302 | 38.779% |
| Mature chickens | 147,769,483 | Not Reported | 700,757,342 | 0.728% |
| Young turkeys | 245,361,497 | Not Reported | 5,047,059,092 | 5.247% |
| Mature turkeys | 1,428,930 | Not Reported | 30,058,730 | 0.031% |
| Ducks | 24,517,721 | Not Reported | 130,498,901 | 0.136% |
| Geese | 175,488 | Not Reported | 102,890 | 0.000% |
| Other fowl (include ratites) | 2,273,199 | Not Reported | 1,219,265 | 0.001% |
| **Subtotal, Poultry** | **8,965,661,730** | | **43,213,358,522** | **44.922%** |
| Rabbits | 71,331 | Not Reported | 340,969 | 0.000% |
| Egg products | Not Applicable | Not Applicable | 4,548,662,539 | 4.729% |
| **TOTAL, ALL PRODUCTION CLASSES** | | | **96,196,154,358** | **100.00%** |

[1] Number of heads is obtained from the Animal Disposition Reporting System (ADRS) and the Public Health Information System (PHIS).

[2] Average dressed weights are obtained from the publication, "Livestock Slaughter 2011 Summary," National Agricultural Statistics Service (NASS), April 2012. In the absence of average weight , an average weight based on the previous calendar year's data was imputed.

**Definitions of FSIS Production Classes**

**Bovine**

- Beef cows are mature female cattle bred for muscle development, ordinarily having given birth to one or more calves.
- Bulls are mature, uncastrated male cattle.
- Calves/veal are recognized as a separate class from suckling calves because of their handling, housing, and proximity to slaughter.
- Dairy cows are mature female cattle bred for milk production, ordinarily having given birth to one or more calves.
- Heifers are young, female cattle that have not yet given birth to a calf.
- Steers are male cattle castrated before sexual maturity.

**Porcine**

- Boars are mature swine showing male sexual characteristics.
- Market hogs are swine usually marketed near 6 months of age and are 200 to 300 pounds live weight.
- Roaster pigs are animals of both sexes and any age marketed with the carcass unsplit and with the head intact.
- Sows are mature female swine ordinarily having given birth to one or more litters.
- Stags are male swine castrated after they have reached sexual maturity.

**Poultry**

- Ducks are birds of both sexes and any age.
- Egg products are yolks, whites, or whole eggs after breaking and are processed as dried, frozen, or liquid.
- Geese are birds of both sexes and any age.
- Mature chickens are adult birds of both sexes, usually more than 10 months of age.
- Mature turkeys are birds of both sexes, usually more than 15 months of age.
- Other poultry include low volume amenable species processed under mandatory inspection and nonamenable species processed under voluntary inspection: ratites (typically ostriches, emus, and rheas), guineas, squabs (young, unfledged pigeons), adult pigeons, pheasants, grouse, partridge, quail, etc.
- Young chickens include broilers/fryers birds of both sexes, usually less than 10 weeks of age.
- Roasters are birds of both sexes, usually less than 12 weeks of age, and capons are surgically castrated male birds, usually less than 8 months of age.
- Young turkeys include fryer/roaster birds that are of both sexes and usually less than 3 to 6 months of age.

**Other**

- Goats are animals of both sexes and any age.
- Lambs are defined as sheep younger than 14 months and having a break joint in at least 1 leg.
- Other livestock include bison, deer, and elk, which are under voluntary inspection.
- Rabbits are any of several lagomorph mammals of both sexes, any age, and are under voluntary inspection.
- Sheep are mature animals of both sexes.

## SUMMARY OF DOMESTIC DATA

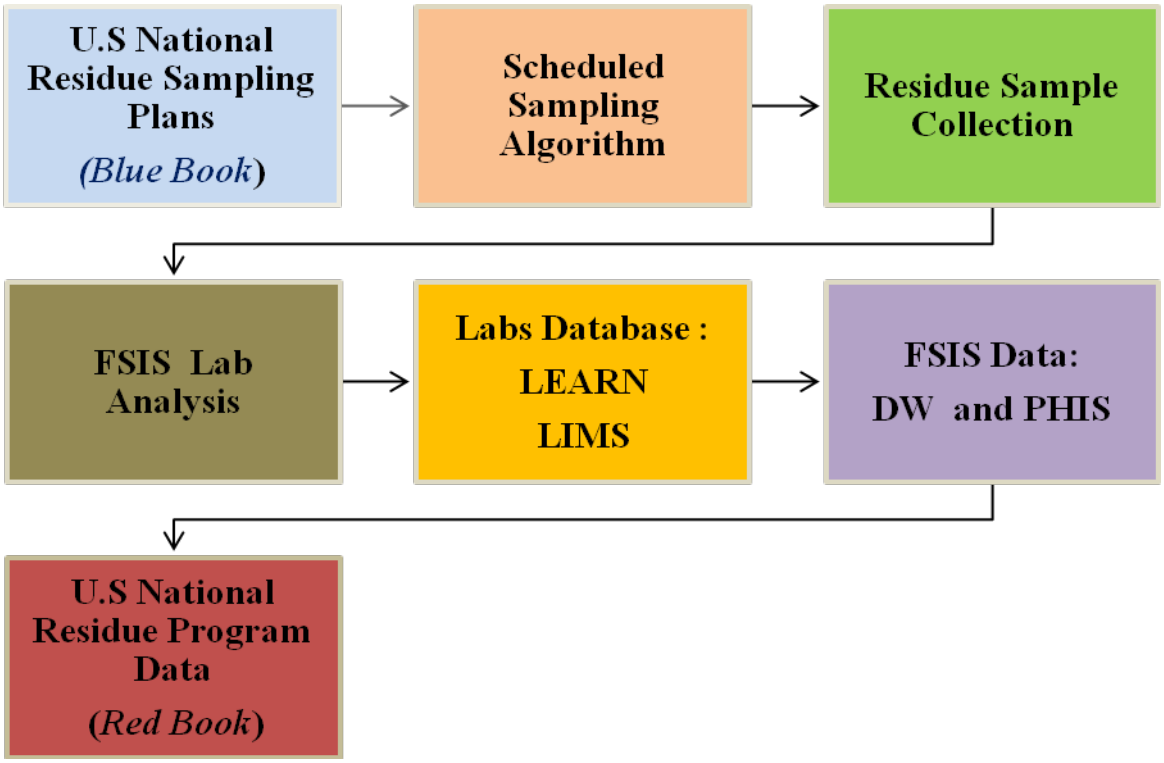
### Scheduled Sampling

Sampling for Baseline Assessments

In 2011, FSIS laboratories analyzed food animal samples for 128 chemical compounds of veterinary drugs and pesticides. Of the 19,676 samples analyzed under domestic scheduled sampling, the NRP identified 27 chemical residue violations: antibiotics (8), avermectins/milbemycins (9), carbadox (1), pesticides (PBDE) (2), sulfonamides (3), flunixin (1), and florfenicol (3).

FSIS laboratories found no residue violations for arsenic, *beta*-agonists, chloramphenicol, nitrofurans, or nitroimidazoles. This section contains the summary results from the domestic scheduled sampling plan by production class and compound class. Tables 2 and 3 display the number of samples, number of violations, and number of non-violative positives (residues detected at levels below the tolerances) for each production class.

**Figure 1. National Residue Program: Domestic Scheduled Samples Flow Chart**



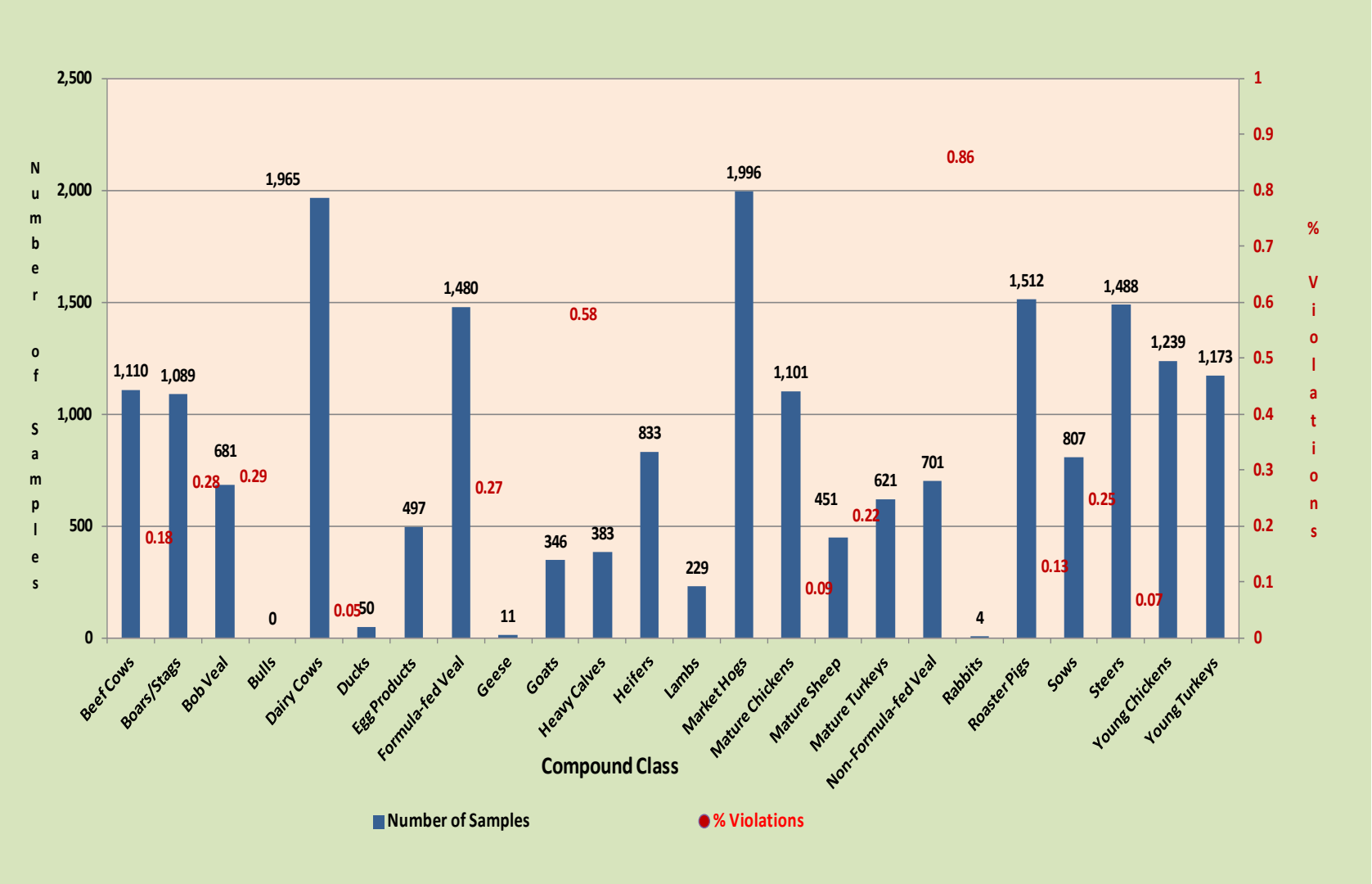

**Note**: The residue sample results with violation also are reported in the Residue Violation Information System (RVIS).

## Production Class

**Table 2. Total Number of Samples by Production Class**
**2011 Domestic Scheduled Sampling Plan**

| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Beef Cows | 1,110 | 13 | 2 | 0.18 |
| Boars/Stags | 1,089 | 1 | 3 | 0.28 |
| Bob Veal | 681 | 3 | 2 | 0.29 |
| Bulls | -- | -- | -- | -- |
| Dairy Cows | 1,965 | 5 | 1 | 0.05 |
| Ducks | 50 | 0 | 0 | 0.00 |
| Egg Products | 497 | 0 | 0 | 0.00 |
| Formula-fed Veal | 1,480 | 22 | 4 | 0.27 |
| Geese | 11 | -- | -- | 0.00 |
| Goats | 346 | 0 | 2 | 0.58 |
| Heavy Calves | 383 | 4 | 0 | 0.00 |
| Heifers | 833 | 0 | 0 | 0.00 |
| Lambs | 229 | 3 | 0 | 0.00 |
| Market Hogs | 1,996 | 2 | 0 | 0.00 |
| Mature Chickens | 1,101 | 0 | 1 | 0.09 |
| Mature Sheep | 451 | 6 | 1 | 0.22 |
| Mature Turkeys | 621 | 5 | 0 | 0.00 |
| Non-Formula-fed | 701 | 1 | 6 | 0.86 |
| Rabbits | 4 | 0 | 0 | 0.00 |
| Roaster Pigs | 1,512 | 7 | 2 | 0.13 |
| Sows | 807 | 1 | 2 | 0.25 |
| Steers | 1,488 | 6 | 1 | 0.07 |
| Young Chickens | 1,239 | 66 | 0 | 0.00 |
| Young Turkeys | 1,173 | 10 | 0 | 0.00 |
| **TOTAL** | **19,767** | **155** | **27** | **0.14** |

**Figure 2. Total Number of Samples and Violation Rate by Production Class**
**2011 Domestic Scheduled Sampling Plan**

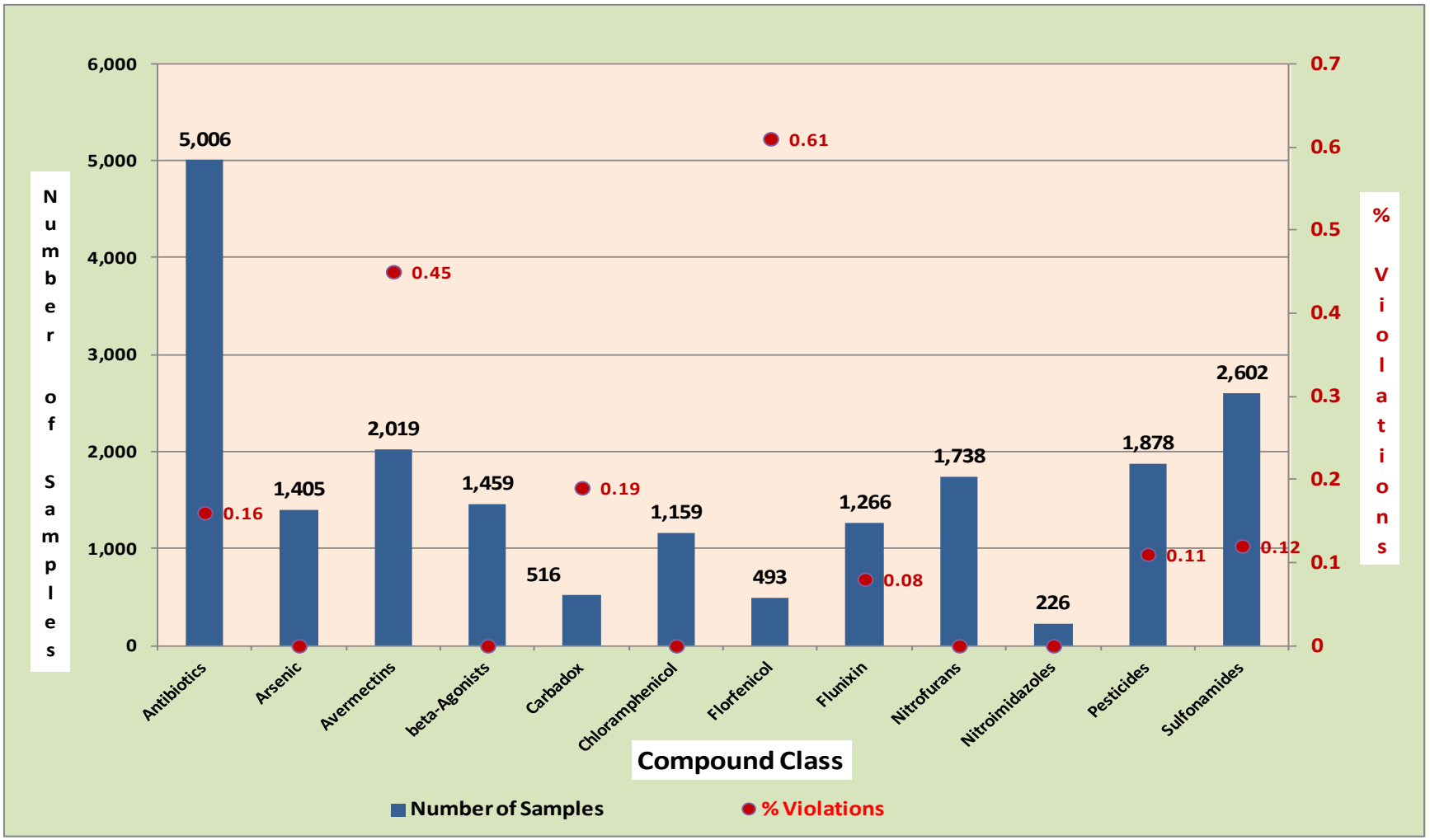


**Compound Class**

**Table 3. Total Number of Samples by Compound Class**
**2011 Domestic Scheduled Sampling Plan**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 5,006 | 47 | 8 | 0.16 |
| Arsenic | 1,405 | 67 | 0 | 0.00 |
| Avermectins | 2,019 | 30 | 9 | 0.45 |
| *beta*-Agonists | 1,459 | 3 | 0 | 0.00 |
| Carbadox | 516 | 1 | 1 | 0.19 |
| Chloramphenicol | 1,159 | 0 | 0 | 0.00 |
| Florfenicol | 493 | 0 | 3 | 0.61 |
| Flunixin | 1,266 | 1 | 1 | 0.08 |
| Nitrofurans | 1,738 | 0 | 0 | 0.00 |
| Nitroimidazoles | 226 | 0 | 0 | 0.00 |
| Pesticides | 1,878 | 4 | 2 | 0.11 |
| Sulfonamides | 2,602 | 2 | 3 | 0.12 |
| **TOTAL** | **19,767** | **155** | **27** | **0.14** |

**Figure 3. Total Number of Samples and Violation Rate by Compound Class**
**2011 Domestic Scheduled Sampling Results**



## Targeted Assessments

Environmental Contaminants

FSIS inspectors submitted samples from 546 market hogs for cadmium and lead testing. The results of the analysis are reported on pages 78–79.

## Inspector-Generated Sampling

Sampling for Suspect Animals

Of the 186,790 samples analyzed, FSIS found 1,289 chemical residue violations in 1,010 animals. The residue violations include 289 (22%) penicillin, 224 (17%) neomycin, and 119 sulfamethazine (9%).

Sampling for Suspect Populations

As part of the inspector-generated program, regulatory requirements exist for some populations of animals, like bob veal and show animals. program, regulatory requirements exist for some populations of animals, like bob veal and show animals, e.g. in Directive 10,800.1, Residue Testing of Show Animals.

The FSIS laboratory used FAST to analyze 56 samples from bob veal calves that previously tested positive during in-plant tests. The samples were sent to laboratories for confirmation of antibiotics and sulfonamides. Bob veal calf testing included samples from both the suspect population and suspect animals. FSIS laboratories confirmed no violations.

FSIS laboratories used KIS™ tests to screen 33,747 samples from bob veal calves (suspect animals and populations) that tested positive during in-plant testing. The samples were sent to laboratories for confirmation of antibiotics and sulfonamides. Of the animals tested, FSIS laboratory confirmed 453 violations in 348 animals. The residue violations consisted of chlortetracycline (1), DCCD (8), dihydrostreptomycin (1), flunixin (30), gentamycin sulfate (22), neomycin (191), oxytetracycline (11), paromomycin (27), penicillin (24), sulfadiazine (3), sulfadimethoxine (17), sulfamethazine (51), sulfamethoxazole (23), sulfathiazole (2), tetracycline (1), tilmicosin (20), and tulathromycin (21).

Show Animals

FSIS laboratories conducted analyses for antibiotics and sulfonamides on two lambs, one market hog, and eight steers; of these samples, only one (steer) tested positive.

**Table 4. Number of Samples Tested by Production Class**
**2011 Domestic Sampling Plan (Scheduled and Inspector-Generated)**
This table refers to KIS™ Test and FAST samples (not including COLLGEN, SHOW, or STATE)

| Production Class | Scheduled Samples Baseline Assessments | Scheduled Samples Targeted Assessments | Inspector-generated Samples, Suspect Animals |
|---|---|---|---|
| Beef Cows | 1,110 | -- | 18,853 |
| Boars/Stags | 1,089 | -- | 120 |
| Bob Veal | 681 | -- | 33,803 |
| Bulls | -- | -- | 2,045 |
| Dairy Cows | 1,965 | -- | 95,275 |
| Ducks | 50 | -- | -- |
| Formula-Fed Veal | 1,480 | -- | 1,594 |
| Geese | 11 | -- | -- |
| Goats | 346 | -- | 499 |
| Heavy Calves | 383 | -- | 315 |
| Heifers | 833 | -- | 3,205 |
| Lambs | 229 | -- | 1,277 |
| Market Hogs | 1,996 | 546 | 12,848 |
| Mature Chickens | 1,101 | -- | -- |
| Mature Sheep | 451 | -- | 484 |
| Mature Turkeys | 621 | -- | --- |
| Non-Formula-Fed Veal | 701 | -- | 542 |
| Rabbits | 4 | -- | -- |
| Roaster Pigs | 1,512 | -- | 1,228 |
| Sows | 807 | -- | 7,051 |
| Steers | 1,488 | -- | 7,651 |
| Young Chickens | 1,239 | -- | -- |
| Young Turkeys | 1,173 | -- | -- |
| Other[3] | 497 | -- | -- |
| **Total** | **19,767** | **546** | **186,790** |

[3] Others: egg products

**Table 5. Number of Samples Tested by Compound Class**
**2011 Domestic Sampling Plan (Scheduled and Inspector-Generated)**
This table refers to KIS™ Test and FAST samples (not including COLLGEN, SHOW, or STATE)

| Compound Class | Scheduled Samples, Baseline Assessments | Scheduled Samples, Targeted Assessments | Inspector-Generated Samples, Suspect Animals |
|---|---|---|---|
| Antibiotics (7-plate bioassay) | 5,006 | - | - |
| Antibiotics, Sulfonamides | - | - | 186,790 |
| Arsenic | 1,405 | - | - |
| Avermectins | 2,019 | - | - |
| *beta*-Agonists | 1,459 | - | - |
| Cadmium | - | 273 | - |
| Carbadox | 516 | - | - |
| CHCs/COPs | 1,878 | - | - |
| Chloramphenicol | 1,159 | - | - |
| Florfenicol | 493 | - | - |
| Flunixin | 1,266 | - | - |
| Lead | - | 273 | - |
| Nitrofurans | 1,738 | - | - |
| Nitroimidazoles | 226 | - | - |
| Sulfonamides | 2,602 | - | - |
| **Total** | **19,767** | **546** | **186,790** |

## Summary of Import Data

The United States imported approximately 2,893,186,281 (2.9 billion) pounds of fresh and processed meat, poultry, and egg products. These products were imported from 26 of the 33 countries eligible for exportation to the United States[6]. All egg products (about 18 million pounds) were imported from Canada. The import-testing program included analysis of approximately 121 chemical residues from 13 compound classes of veterinary drugs and pesticides. Of 2,880 samples analyzed, 16 violations of avermectin were detected.

### Normal

Thirteen compound classes of veterinary drugs and pesticides were tested. Of the 2,745 samples analyzed, 9 violations of avermectin were detected.

### Increased

No samples were tested under this import project

### Intensified

Of the 135 samples analyzed, 9 avermectins violations were detected.

[6] The 26 countries eligible for import include Argentina, Australia, Brazil, Canada, Chile, Costa Rica, Croatia, Denmark, Finland, Germany, Honduras, Hungary, Ireland, Israel, Italy, Mexico, Netherlands, New Zealand, Nicaragua, Northern Ireland, Poland, San Marino, Spain, Sweden, United Kingdom, and Uruguay.

**Note:** United Kingdom includes England, Scotland, and Wales, which are under one inspection system, as well as Northern Ireland, which is under a separate inspection system and is listed separately.

Source: Office of International Affairs; Food Safety and Inspection Service
www.fsis.usda.gov/pdf/import_summary_2011.pdf

**Figure 4. 2011 Imported Meat and Poultry Products by Country (% of total net weight)**

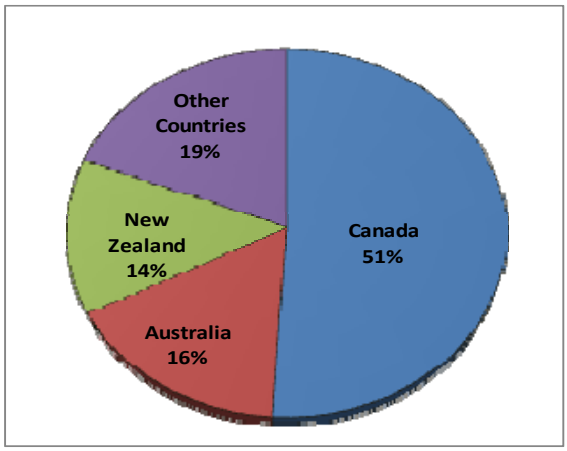



**Figure 5. 2011 Imported Meat and Poultry Products by Species and Type (% of total net weight)**

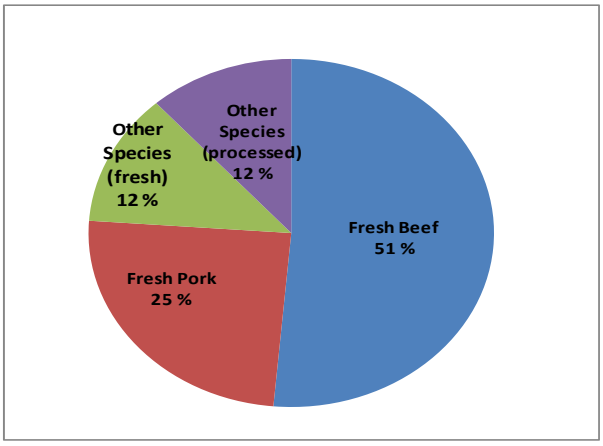
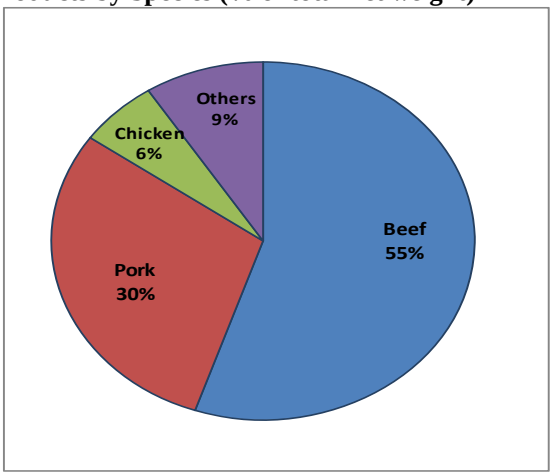



**Figure 6. 2011 Imported Meat and Poultry Products by Species (% of total net weight)**



**DOMESTIC SAMPLING RESULTS: Compound Class Data**

Tables 6–16 list summary and detailed results by production class obtained from the FSIS Data Warehouse (DW), and Public Health Information System (PHIS).

Tables 6a–16a present domestic scheduled sampling results. Column 1 lists the production classes and column 2 lists the number of samples collected for each class. Column 3 lists the number of non-violative positives, which are, compounds detected at a level equal to or below the established tolerance level. Columns 4 and 5 show the number of violations and the percent of violations (as calculated from the number of samples) for each compound class. Because multiple compounds can be analyzed on the same sample, one sample (i.e., one animal or a composite from one poultry flock) could have more than one violation. A series of bar charts illustrate these data.

Tables 6b–16b summarizes violation results for each production class (column 1). Column 2 lists the compound class; column 3, the chemical residue; column 4, the tissue type; and column 5, the amount of residue detected (ppb or ppm). These tables are contingent on violations being detected. Tables are only provided for compound classes with residue violations (b).

The additional columns indicate instances when residues were detected, but were not quantitated violative (code: *8888*) or non-violative (code: *9999*).

Tables 17 and 18 list the distribution of non-violative positive samples by chemical class and product class. Column 1 lists the production class, and the remaining columns list each chemical class or residue. Samples listed in these tables have residue present; however, the residue concentration is below the tolerance levels.

## Antibiotics

An antibiotic is a chemical substance that has the capability in dilute solutions to destroy or inhibit the growth of microorganisms. The widespread use of antibiotics over time has allowed microorganisms to adapt and develop resistance to these drugs.[1,2] Hence, inappropriate use and exposure to antibiotics can increase the risk of getting an infection that resists antibiotic treatment.[3] In addition, allergies to antibiotics have been reported in children and adults[4] and use of antibiotics in infants has been associated with childhood asthma.[5] FSIS tests different classes of antibiotics: aminoglycosides, *beta*-lactams, fluoroquinolones, macrolides, tetracyclines, and sulfonamides.[6]

The antibiotics quantitated by the 7-plate bioassay and associated follow-up methodologies range from ceftiofur, one of the most widely sold animal drugs in the U.S., to fluoroquinolone antibiotics, prohibited by the FDA from extra-label use in animals intended for food (see Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA)). Appendix I contains a complete list of the antibiotics in the 7-plate bioassay.

FSIS laboratories analyzed 5,006 samples for antibiotic residues and detected 8 violations and 47 non-violative positives. The residue violations consisted of 1 neomycin, 4 penicillin, 1 tilmicosin, and 2 tulathromycin.

[1] http://www.cdc.gov/drugresistance/about.html
[2] http://www.cdc.gov/drugresistance/pdf/public-health-action-plan-combat-antimicrobial-resistance.pdf
[3] http://www.cdc.gov/getsmart/antibiotic-use/know-and-do.html
[4] JM Langley and S Halperin (2002) *Can J Infect Dis*, **13(3)**:160-163 and http://www.allergy.org.au/health-professionals/hp-information/asthma-and-allergy/allergic-reactions-to-antibiotics
[5] Risnes *et al*. (2011) *Am J Epidemiol*, **173**:310–318
[6] http://www.fsis.usda.gov/Science/Chemistry_Lab_Guidebook/index.asp

**Table 6a. Antibiotics Summary - 2011 Domestic Scheduled Sampling Results**

| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Beef Cows | 290 | 3 | 1 | 0.34 |
| Boars/Stags | 290 | 1 | 0 | 0.00 |
| Bob Veal | 251 | 3 | 1 | 0.40 |
| Dairy Cows | 330 | 2 | 0 | 0.00 |
| Ducks | 50 | 0 | 0 | 0.00 |
| Formula-Fed Veal | 292 | 10 | 0 | 0.00 |
| Geess | 11 | 0 | 0 | 0.00 |
| Goats | 76 | 0 | 0 | 0.00 |
| Heavy Calves | 163 | 4 | 0 | 0.00 |
| Heifers | 309 | 0 | 0 | 0.00 |
| Lambs | 229 | 3 | 0 | 0.00 |
| Market Hogs | 302 | 1 | 0 | 0.00 |
| Mature Chickens | 307 | 0 | 0 | 0.00 |
| Mature Sheep | 223 | 2 | 0 | 0.00 |
| Mature Turkeys | 203 | 1 | 0 | 0.00 |
| Non-Formula-Fed Veal | 257 | 0 | 3 | 1.17 |
| Rabbits | 4 | 0 | 0 | 0.00 |
| Roaster Pigs | 267 | 4 | 1 | 0.37 |
| Sows | 305 | 0 | 2 | 0.66 |
| Steers | 224 | 0 | 0 | 0.00 |
| Young Chickens | 314 | 5 | 0 | 0.00 |
| Young Turkeys | 309 | 8 | 0 | 0.00 |
| **Total** | **5,006** | **47** | **8** | **0.16** |

**Figure 7. Antibiotics Summary**
**2011 Domestic Scheduled Sampling Results**

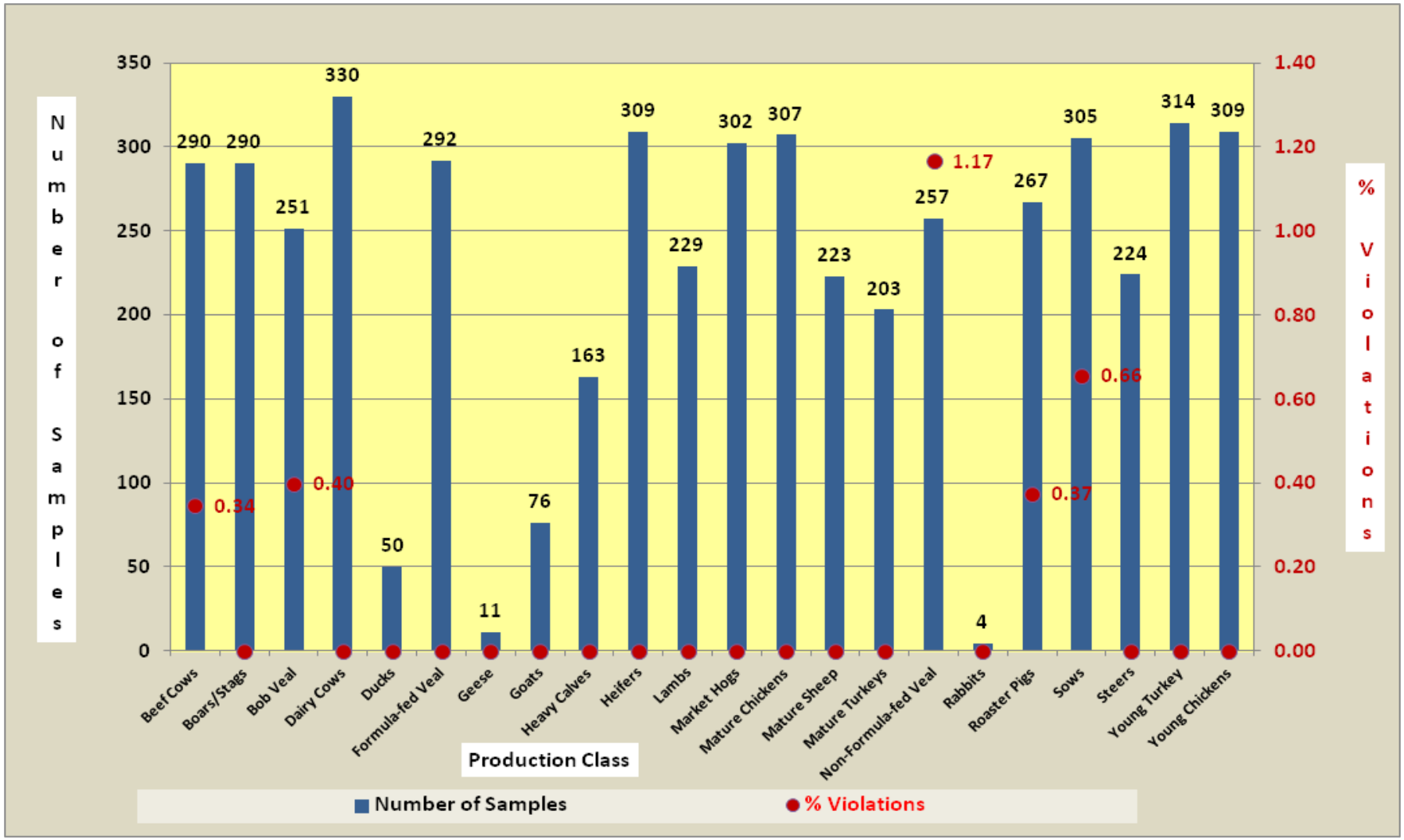


**Table 6b. Antibiotics Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Compound Class | Residue | Tissue | Result (ppm) |
|---|---|---|---|---|
| Bob Veal | Antibiotics | Neomycin | Kidney | 19.6 |
| Non Formula-fed Veal | Antibiotics | Tulathromycin | Kidney | 8888* |
| | | | | 8888* |
| Sows | Antibiotics | Penicillin | Kidney | 8888* |
| | | | | 8888* |
| Roaster Pigs | Antibiotics | Penicillin | Kidney | 8888* |
| Non Formula-fed Veal | Antibiotics | Tilmicosin | Liver | 12.082 |
| Beef Cows | Antibiotics | Penicillin | Kidney | 0.09 |

*8888 means detected, violative, but not quantified.

**Arsenic**[8]

In humans, the predominant dietary source of arsenic is seafood, followed by rice/rice cereal, mushrooms and poultry[1]. Ingestion of inorganic arsenic can cause gastrointestinal irritation and decreased red and white blood cell production, which can result in fatigue, abnormal heart rhythm, and nervous system effects (e.g., pins and needles): high oral doses can cause death. Similar effects are expected in children. Evidence suggests that following long-term exposure, children show lower IQ scores. Inorganic arsenic is a known human carcinogen[1].

Arsenical compounds are used in swine and poultry to promote growth, prevent coccidiosis, and bacterial enteritis.

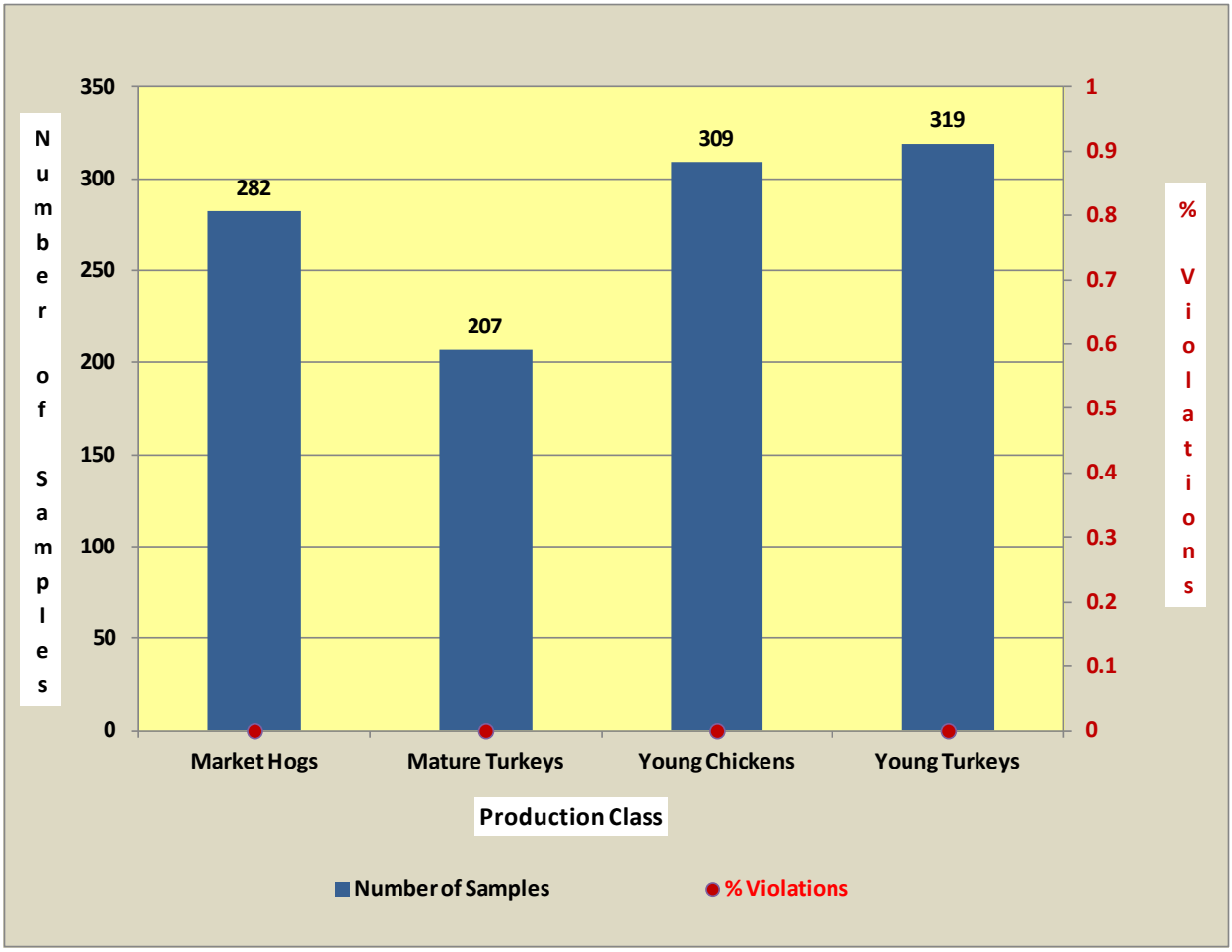
FSIS laboratories analyzed 1,117 samples from Market Hogs, Mature Turkeys, Young Chickens, and Young Turkeys; 0 violations and 67 non-violative positives were detected.

**Table 7a. Arsenic Summary**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Market Hogs | 282 | 0 | 0 | 0.00 |
| Mature Turkeys | 207 | 4 | 0 | 0.00 |
| Young Chickens | 309 | 61 | 0 | 0.00 |
| Young Turkeys | 319 | 2 | 0 | 0.00 |
| **TOTAL** | **1,117** | **67** | **0** | **0.00** |

[8] The method reduces organic arsenic to inorganic arsenic prior to quantification. The reported results include both original organic and inorganic arsenic species.
[1] http://www.atsdr.cdc.gov/ToxProfiles/tp2.pdf

**Figure 8. Arsenic Summary**
**2011 Domestic Scheduled Sampling Results**



## Avermectins (Ivermectin and Doramectin) and Milbemycins (Moxidectin)

Avermectins (ivermectin and doramectin) and milbemycins (moxidectin) are macrocyclic lactones used in animal husbandry practices to prevent nematode and arthropod parasites. Ivermectin is an effective parasiticide. Doramectin is a potent endectocide that combines broad-spectrum activity with a prolonged duration of activity against the major internal and external parasites of cattle. Moxidectin is an antiparasitic drug that controls a range of internal and external parasites in sheep and cattle. Avermectins share their common antiparasitic activity via interaction at cell membrane receptors; mammals are less susceptible to the toxic effects because avermectins do not readily cross the blood-brain barrier. Nevertheless, adults and children are susceptible to effects on the nervous system. These effects include nausea and vomiting, dizziness, coma, and potentially death at high doses.[1]

FSIS laboratories analyzed 2,019 samples for avermectin and milbemycin residues: 3 moxidectin, 4 doramectin, and 2 ivermectin violations were detected.

**Table 8a. Avermectins and Milbemycins Summary**
**2011 Domestic Scheduled Sampling Results**

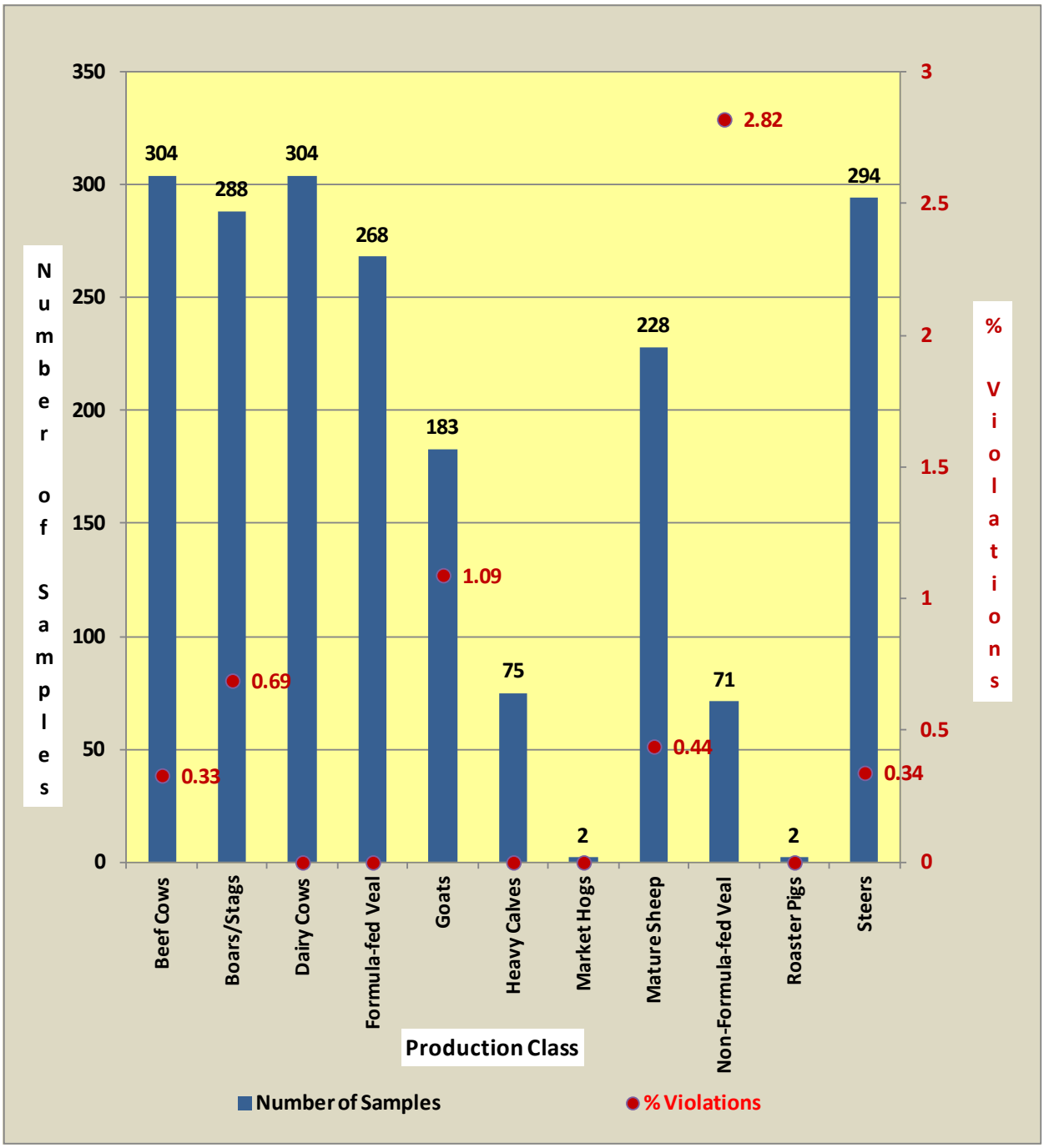
| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Beef Cows | 304 | 10 | 1 | 0.33 |
| Boars/Stags | 288 | 0 | 2 | 0.69 |
| Dairy Cows | 304 | 2 | 0 | 0.00 |
| Formula-fed Veal | 268 | 10 | 0 | 0.00 |
| Goats | 183 | 0 | 2 | 1.09 |
| Heavy Calves | 75 | 0 | 0 | 0.00 |
| Market Hogs | 2 | 0 | 0 | 0.00 |
| Mature Sheep | 228 | 4 | 1 | 0.44 |
| Non-Formula-Fed Veal | 71 | 1 | 2 | 2.82 |
| Roaster Pigs | 2 | 0 | 0 | 0.00 |
| Steers | 294 | 3 | 1 | 0.34 |
| **TOTAL** | **2,019** | **30** | **9** | **0.45** |

[1] http://www.asiatox.org/6th%20APAMT%20pdf/Mectins%20posioning%20vs%20Avermectin%20poisoning.pdf

**Table 8b. Avermectins Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Compound Class | Residue | Tissue | Result (ppb) |
|---|---|---|---|---|
| Mature Sheep | Avermectins | Doramectin | Liver | 52.85 |
| Boar/Stags | Avermectins | Doramectin | Liver | 346.25 |
| Boar/Stags | Avermectins | Ivermectin | Liver | 20.75 |
| Beef Cows | Avermectins | Doramectin | Liver | 230.25 |
| Goats | Avermectins | Moxidectin | Liver | 56.4 |
| | | | | 53.8 |
| Non Formula-Fed Veal | Avermectins | Moxidectin | Liver | 15 |
| Non Formula-Fed Veal | Avermectins | Doramectin | Liver | 32.8 |
| Steers | Avermectins | Ivermectin | Liver | 115.5 |

**Figure 9. Avermectins and Milbemycins Summary**
**2011 Domestic Scheduled Sampling Results**



## *beta*-Agonists (Clenbuterol, Cimaterol, Ractopamine, Salbutamol, and Zilpaterol)

Beta-agonists are used for growth promotion in food animals, increasing lean muscle mass. Clenbuterol, a growth promotant, is not currently registered for use in livestock in the U.S. and is listed in AMDUCA as prohibited from extra-label use in animals intended for food. Ractopamine is used for increased rate of weight gain, improved feed efficiency, increased carcass leanness, and prevention and/or control of porcine proliferative enteropathies (ileitis). Zilpaterol is used for increased rate of weight gain, improved feed efficiency, and increased carcass leanness in cattle fed in confinement for slaughter during the last 20 to 40 days on feed. While the other *beta*-agonists are approved for use in the United States, cimaterol and salbutamol are not approved for use in food animals. In humans, clenbuterol and salbutamol are used as bronchodilators by asthma sufferers and as performance-enhancing drugs by athletes. Human side effects include increased heart rate and blood pressure, anxiety, palpitation and skeletal muscle tremors. The prolonged use of long-acting beta agonists can lead to the severe exacerbation of asthma symptoms[1].

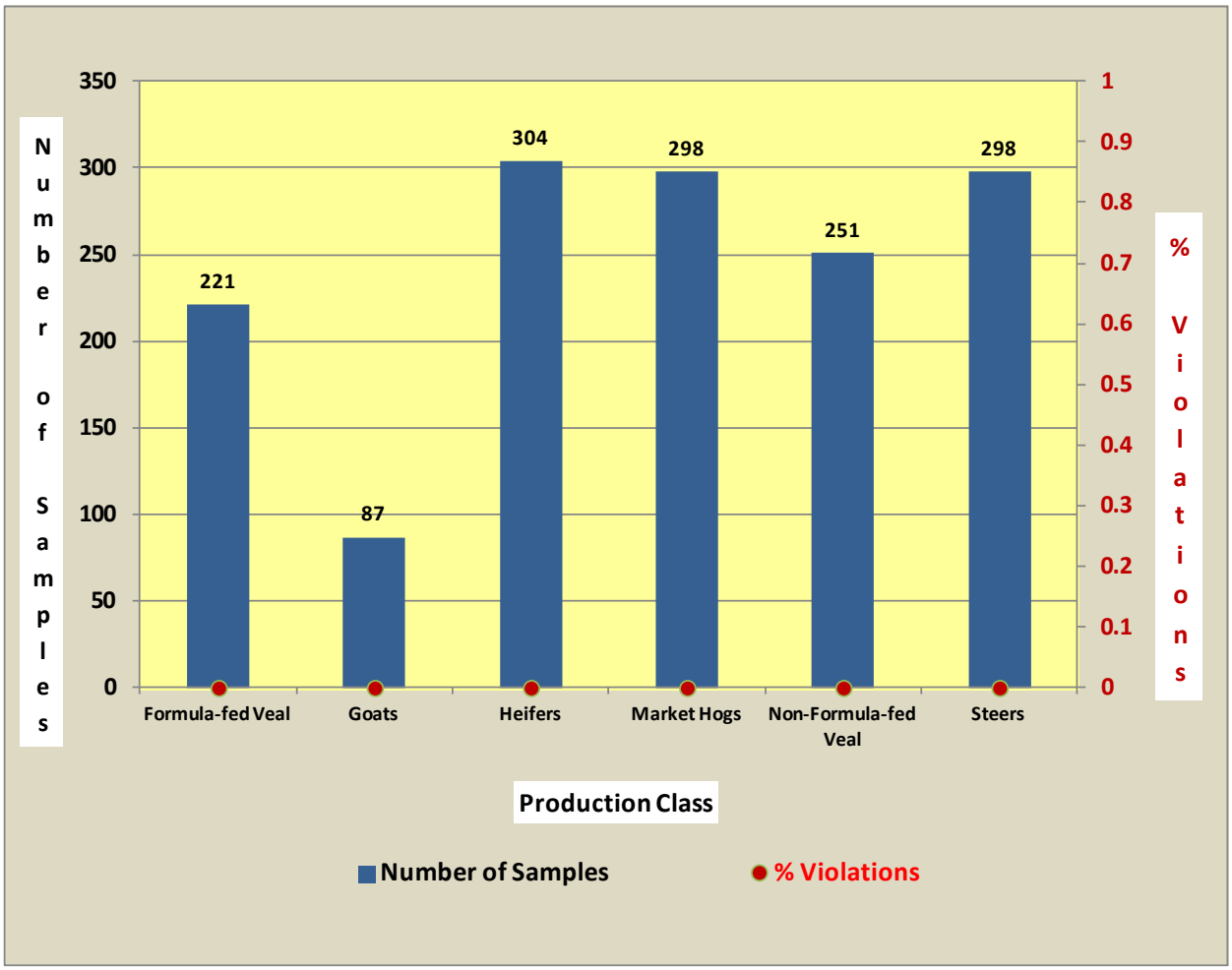
FSIS laboratories analyzed 1,459 samples for *beta*-agonists residues. This study found zero violations for all *beta*-agonists and three non-violative positives.

**Table 9a. *beta*-Agonists Summary**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Formula-fed Veal | 221 | 0 | 0 | 0.00 |
| Goats | 87 | 0 | 0 | 0.00 |
| Heifers | 304 | 0 | 0 | 0.00 |
| Market hogs | 298 | 1 | 0 | 0.00 |
| Non Formula-Fed Veal | 251 | 0 | 0 | 0.00 |
| Steers | 298 | 2 | 0 | 0.00 |
| **TOTAL** | **1,459** | **3** | **0** | **0.00** |

[1] http://www.fda.gov/Drugs/ResourcesForYou/HealthProfessionals/ucm219161.htm

**Figure 10. *beta*-Agonists Summary**
**2011 Domestic Scheduled Sampling Results**



**Carbadox**

Carbadox is a growth-promoting and antibacterial drug[1] approved to prevent or treat intestinal track inflammation (enteritis), as well as to improve feed efficiency and weight gain in swine. Carbadox and some of its metabolites (desoxycarbadox and hydrazine) are genotoxic and carcinogenic in rodents; however, the final metabolite, quinoxaline-2-carboxylic acid is not mutagenic or carcinogenic in animals. Based on the genotoxicity data, an acceptable daily intake has not been established for carbadox[2]. FSIS laboratories analyzed 516 swine samples for carbadox: 294 in market hog and 221 in roaster pig (liver tissue). The results revealed one violation and one non-violative positive.

**Table 10a. Carbadox Summary**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Market Hogs | 294 | 0 | 0 | 0.00 |
| Roaster Pigs | 221 | 1 | 1 | 0.45 |
| Steer | 1 | 0 | 0 | 0.00 |
| **TOTAL** | 516 | 1 | 1 | 0.19 |

**Table 10b. Carbadox Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Compound Class | Residue | Tissue | Result (ppb) |
|---|---|---|---|---|
| Roaster Pigs | Carbadox | Carbadox | Liver | 115.471 |

[1] http://www.inchem.org/documents/jecfa/jecmono/v27je07.htm
and http://www.inchem.org/documents/jecfa/jecmono/v51je05.htm
[2] http://www.inchem.org/documents/jecfa/jeceval/jec_352.htm

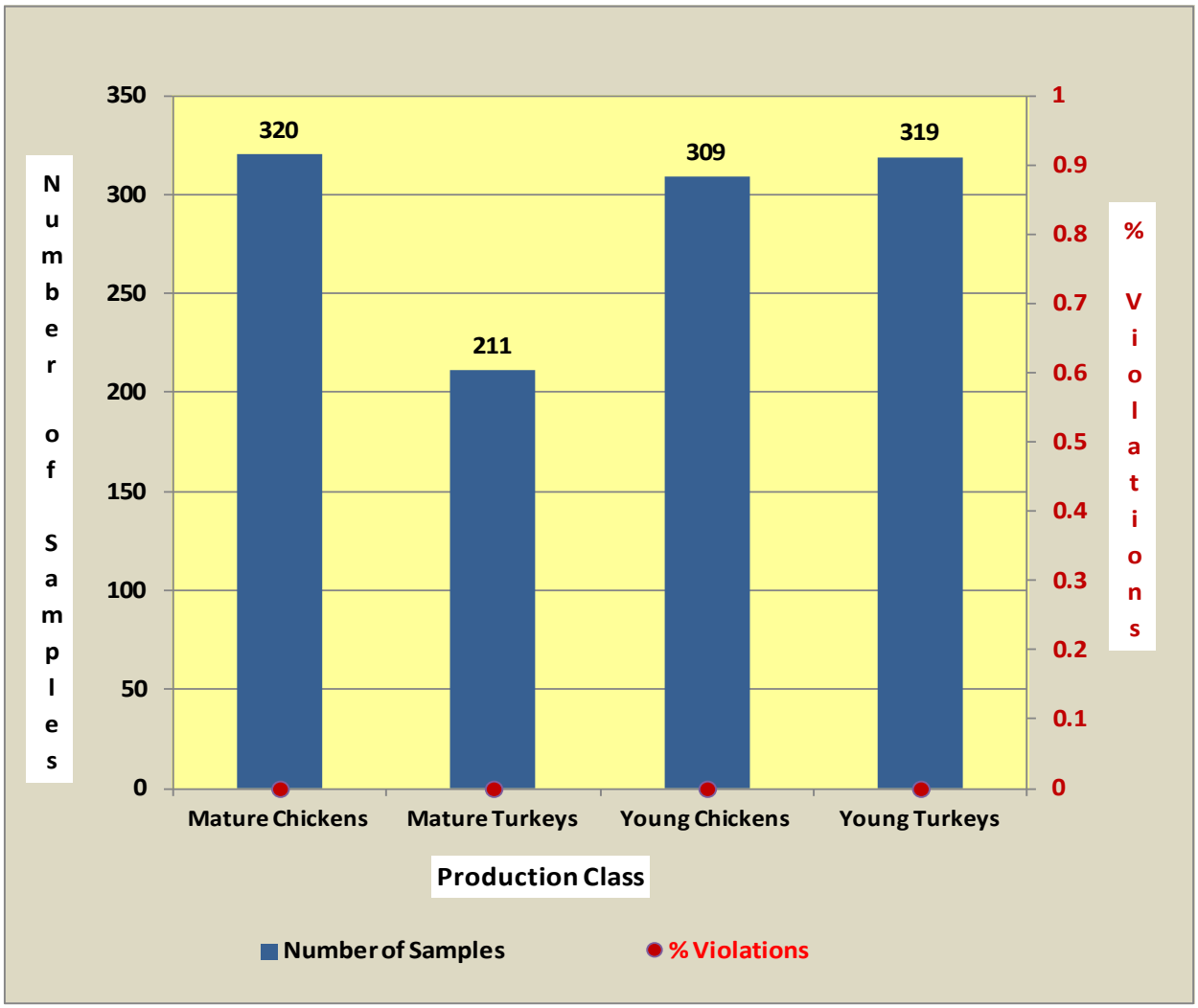
**Chloramphenicol**

Chloramphenicol is a potent, broad-spectrum antibiotic with severe toxic effects in humans: bone marrow suppression or aplastic anemia in susceptible individuals. While microorganisms have developed resistance to the drug, it is still used selectively to treat bacterial infections. This drug is AMDUCA-prohibited for extra label use in animals intended for food. FSIS laboratories analyzed 1,159 samples for chloramphenicol in Mature Chickens, Mature Turkeys, Young Chickens, and Young Turkeys (muscle tissue). The laboratories detected zero violations and zero non-violative positives.

**Table 11a. Chloramphenicol Summary**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Mature Chickens | 320 | 0 | 0 | 0.00 |
| Mature Turkeys | 211 | 0 | 0 | 0.00 |
| Young Chickens | 309 | 0 | 0 | 0.00 |
| Young Turkeys | 319 | 0 | 0 | 0.00 |
| **TOTAL** | **1,159** | **0** | **0** | **0.00** |

**Figure 11. Chloramphenicol Summary**
**2011 Domestic Scheduled Sampling Results**



## Chlorinated Hydrocarbons and Chlorinated Organophosphates (Pesticides)

Chlorinated hydrocarbons, chlorinated organophosphates, organophosphates, and pyrethroids are effective insecticides[1]. Some of these compounds, such as DDT, are no longer marketed because of their extremely slow degradation in the environment (long half-life). Organophosphates and pyrethroids affect the nervous system, generally by disrupting the enzyme that regulates the neurotransmitter, acetylcholine. Typical symptoms of acute intoxication are headaches, dizziness, muscle twitching, weakness, tingling sensations, and nausea[2]. Children are at greater risk to some pesticides because their developing organs offer less protection than those of adults and they often eat different foods than adults[3]. Chlorinated hydrocarbons, especially polychlorinated hydrocarbons (PCBs), can cause cancer.[4] Non-cancer effects in animals include effects on the immune system, the reproductive system, the nervous system, and the endocrine system.[4]

FSIS employs analytical methodologies to detect these pesticides and environmental contaminants, such as PCBs. Appendix I provide a complete list of the analytes for this multi-residue method.

FSIS laboratories analyzed 1,878 samples for chlorinated hydrocarbons and chlorinated organophosphates residues. One sample tested positive for piperonyl butoxide, and another tested positive for carbaryl. Both compounds are environmental contaminants without established tolerances. Four non-violative positive samples were detected.

**Table 12a. Chlorinated Hydrocarbons and Chlorinated Organophosphates Summary 2011 Domestic Scheduled Sampling Results**

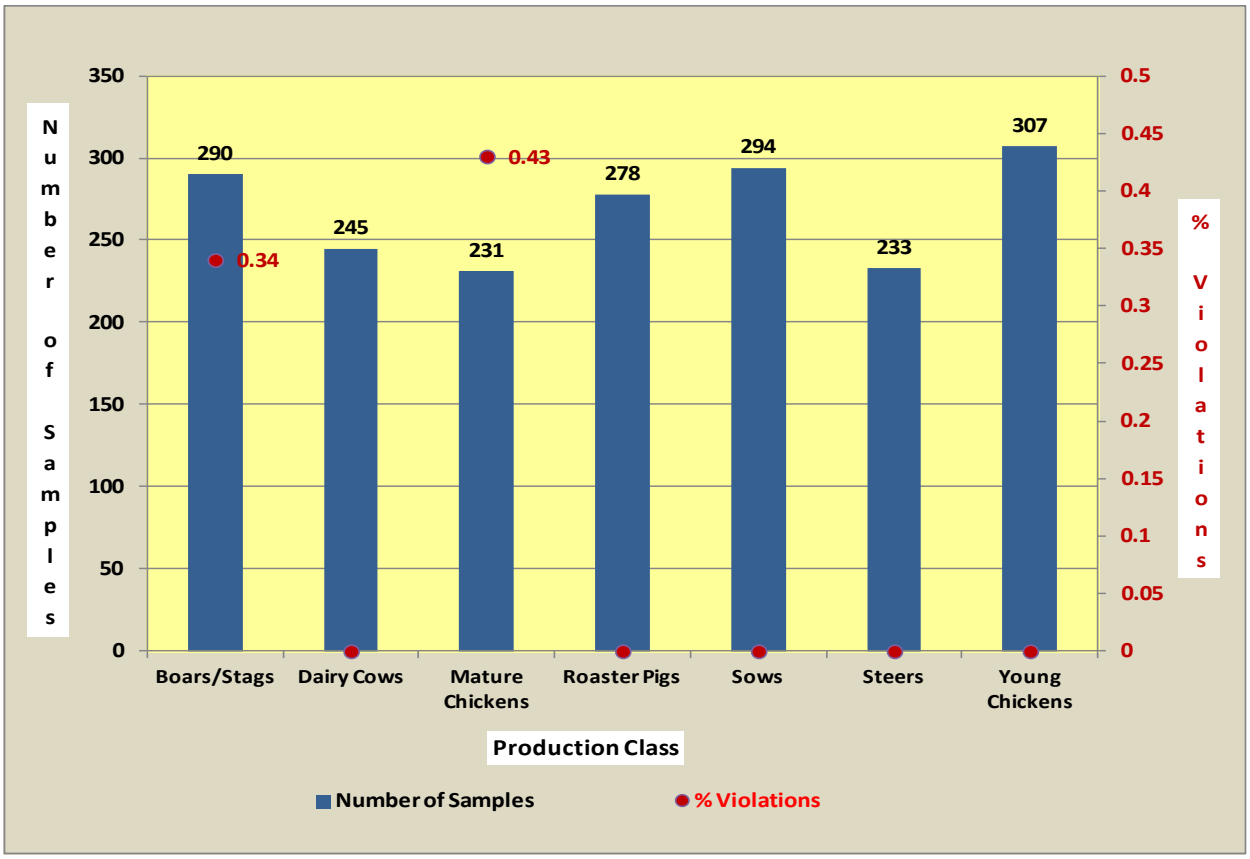
| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Boars/Stags | 290 | 0 | 1 | 0.34 |
| Dairy Cows | 245 | 0 | 0 | 0.00 |
| Mature Chickens | 231 | 0 | 1 | 0.43 |
| Roaster Pigs | 278 | 2 | 0 | 0.00 |
| Sows | 294 | 1 | 0 | 0.00 |
| Steers | 233 | 1 | 0 | 0.00 |
| Young Chickens | 307 | 0 | 0 | 0.00 |
| **TOTAL** | **1,878** | **4** | **2** | **0.11** |

[1] http://www.epa.gov/pesticides/about/types.htm#chemical
[2] http://www.epa.gov/oppfead1/Publications/whatyouneed-hsstaff.pdf
[3] http://www.epa.gov/pesticides/food/pest.htm
[4] http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/effects.htm

**Table 12b. Chlorinated Hydrocarbons and Chlorinated Organophosphates Violations Report 2011 Domestic Scheduled Sampling Results**

| Production Class | Compound Class | Residue | Tissue | Result (ppm) |
|---|---|---|---|---|
| Boars/Stags | Pesticides | Piperonyl Butoxide | Muscle | 0.117 |
| Mature Chickens | Pesticides | Carbaryl | Muscle | 8888* |

**Figure 12. Chlorinated Hydrocarbons and Chlorinated Organophosphates Summary 2011 Domestic Scheduled Sampling Results**




*8888 means detected, violative, but not quantified.

## Florfenicol

Florfenicol is a broad-spectrum bacteriostatic antibiotic. It is typically used to treat cattle (bovine respiratory disease and foot rot)[1], although it has recently been approved for freshwater fish[2]. Horses and other equine animals may experience diarrhea. Toxicity studies in dogs, rats, and mice have associated the use of florfenicol with testicular degeneration and atrophy[3]. FSIS laboratories analyzed 493 samples for florfenicol residues; the analyses indicated 3 violations and zero non-violative positives.

**Table 13a. Florfenicol Summary**
**2011 Domestic Scheduled Sampling Results**

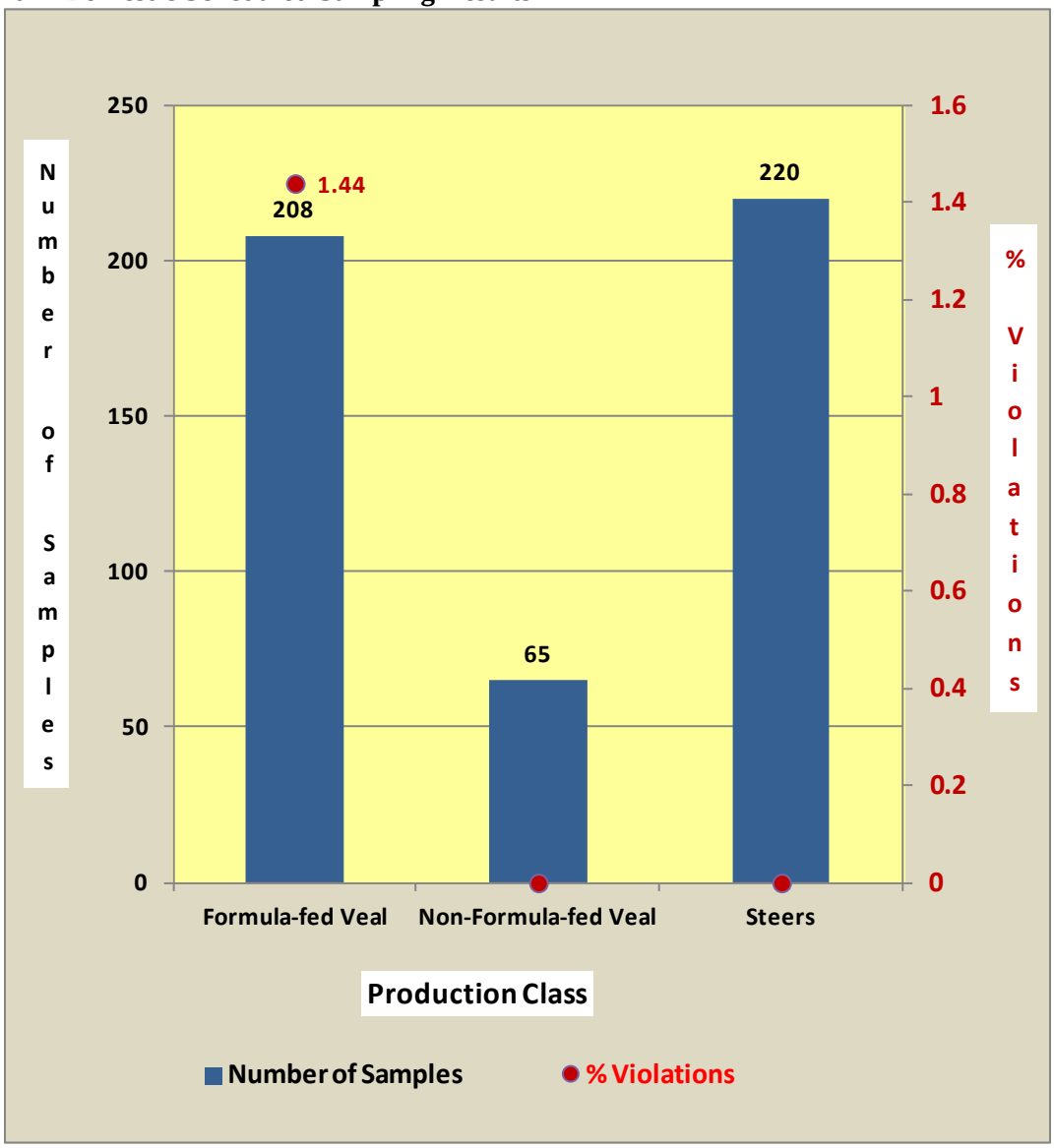
| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Formula-Fed Veal | 208 | 0 | 3 | 1.44 |
| Non-Formula-Fed Veal | 65 | 0 | 0 | 0.00 |
| Steers | 220 | 0 | 0 | 0.00 |
| **TOTAL** | **493** | **0** | **3** | **0.61** |

**Table 13b. Florfenicol Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Compound Class | Residue | Tissue | Result (ppm) |
|---|---|---|---|---|
| Formula-Fed Veal | Florfenicol | Florfenicol | Liver | 0.3 |
| Formula-Fed Veal | Florfenicol | Florfenicol | Liver | 0.53 |
| Formula-Fed Veal | Florfenicol | Florfenicol | Liver | 0.5 |

[1] http://www.nuflor.com/
[2] http://www.merck-animal-health-usa.com/products/130_163256/productdetails_130_163418.aspx
[3] http://intervetus.naccvp.com/?m=product_view&u=intervetus&p=intervetus&id=1047137

**Figure 13. Florfenicol Summary**
**2011 Domestic Scheduled Sampling Results**



**Flunixin**

Flunixin is a non-steroidal anti-inflammatory drug (NSAID) with approved use in swine and cattle to alleviate inflammation and pain associated with musculoskeletal disorders. In general, NSAIDs in animals and humans can produce gastrointestinal (GI) side effects if the drug is taken at high doses over a prolonged period of time. GI ulceration is the most common side effect; however, kidney damage and bleeding problems can also occur[1].

FSIS laboratories analyzed 1,266 samples for flunixin residues and detected 1 violation and 1 non-violative positive.

**Table 14a. Flunixin Summary**
**2011 Domestic Scheduled Sampling Results**

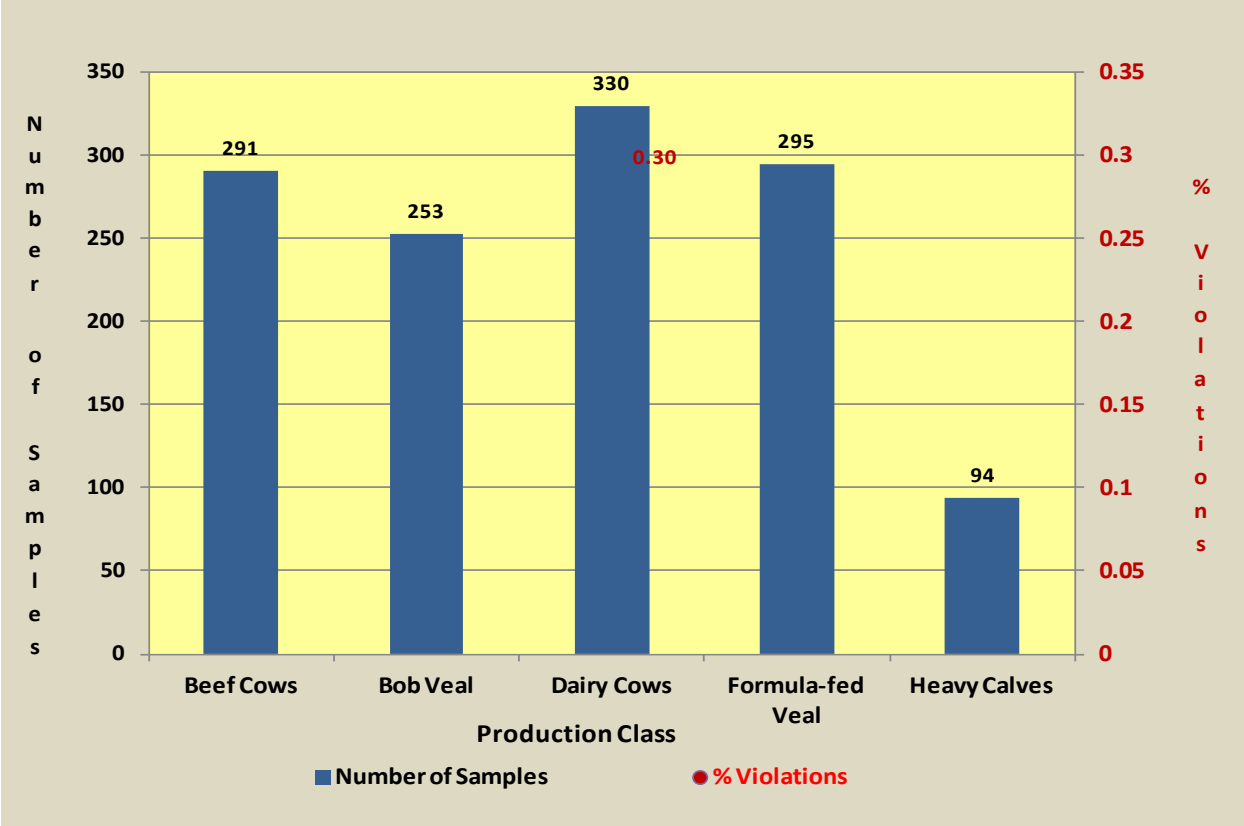
| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Beef Cows | 291 | 0 | 0 | 0.00 |
| Bob Veal | 253 | 0 | 0 | 0.00 |
| Dairy Cows | 330 | 1 | 1 | 0.30 |
| Formula-Fed Veal | 295 | 0 | 0 | 0.00 |
| Heavy Calves | 94 | 0 | 0 | 0.00 |
| Heifers | 1 | 0 | 0 | 0.00 |
| Non-Formula-Fed Veal | 1 | 0 | 0 | 0.00 |
| Steers | 1 | 0 | 0 | 0.00 |
| **TOTAL** | **1,266** | **1** | **1** | **0.08** |

**Table 14b. Flunixin Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Compound Class | Residue | Tissue | Result (ppm) |
|---|---|---|---|---|
| Dairy Cows | Flunixin | Flunixin | Liver | 0.342 |

[1] http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/191606.htm&word=flunixin

**Figure 14. Flunixin Summary**
**2011 Domestic Scheduled Sampling Results**



**Nitrofurans**

Nitrofurans are synthetic chemotherapeutic agents with a broad antimicrobial spectrum[1]. Furaltadone is a synthetic nitrofuran antibiotic used to prevent intestinal infections and mastitis. It is not approved for use in food-producing animals. Furazolidone, which has wide-ranging applicability, is used to treat intestinal infections and is AMDUCA-prohibited for extra-label use. In small calves, overuse can lead to neurotoxicity (head tremors, ataxia, visual impairment, and convulsions). Nitrofurans are potentially carcinogenic and are not generally recognized as safe under any conditions of intended use that may reasonably be expected to result in their becoming a component of food[2].

FSIS laboratories analyzed 1,738 samples (Dairy Cows, Market Hogs, and Roaster Pigs) for nitrofuran (furazolidone and furaltadone) residues in liver tissue and detected zero violations.

**Table 15a. Nitrofurans Summary**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Dairy Cows | 534 | 0 | 0 | 0.00 |
| Market Hogs | 614 | 0 | 0 | 0.00 |
| Roaster Pigs | 590 | 0 | 0 | 0.00 |
| **TOTAL** | **1,738** | **0** | **0** | **0.00** |

**Nitroimidazoles**

Nitroimidazoles, such as dimetridazole and ipronidazole, are used to treat bacterial infections and parasites, but are AMDUCA-prohibited for extra-label use. For human health, the main targets for toxicity are the gastrointestinal tract and the nervous system[3]. Allergic reactions (skin rash, itching) may also occur[4].

FSIS laboratories analyzed 226 samples for nitroimidazole (hydroxyipronidazone and hydoxydimetridazole) residues and detected zero violations and zero non-violative positive residues.

[1] http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/191283.htm
[2] http://www.accessdata.fda.gov/cms_ia/importalert_33.html
[3] Roe FJC (1984) Safety of Nitroimidazoles; http://www.pnlee.co.uk/documents/FJCR_CV/ROE1984L.pdf and http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/191284.htm
[4] http://www.antibioticslist.com/nitroimidazoles.html

**Sulfonamides**

Sulfonamides are a group of drugs used to treat infections. Some of these drugs have bacteriostatic action. Oral exposure to sulfonamides can lead to hypersensitivity reactions (e.g. rashes and Stevens-Johnson Syndrome), effects on urine, effects on blood, photosensitivity and effects on the nervous system (e.g., insomnia and headaches). Neonates are susceptible to kernicterus.[1] As with other antibiotics, microorganisms are developing resistance to this class of drugs. FSIS laboratories analyzed 2,393 samples for sulfonamides and detected 2 non-violative positives, 2 sulfamethazine violations, and 1 sulfadimethoxine violation.

**Table 16a. Sulfonamides Summary**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Sample Percent Violations |
|---|---|---|---|---|
| Beef Cows | 225 | 0 | 0 | 0.00 |
| Boars/Stags | 221 | 0 | 0 | 0.00 |
| Bob Veal | 177 | 0 | 1 | 0.56 |
| Dairy Cows | 222 | 0 | 0 | 0.00 |
| Formula-fed Veal | 196 | 2 | 1 | 0.51 |
| Heavy Calves | 51 | 0 | 0 | 0.00 |
| Heifers | 219 | 0 | 0 | 0.00 |
| Market Hogs | 204 | 0 | 0 | 0.00 |
| Mature Chickens | 243 | 0 | 0 | 0.00 |
| Non-Formula-Fed Veal | 56 | 0 | 1 | 1.79 |
| Roaster Pigs | 154 | 0 | 0 | 0.00 |
| Sows | 208 | 0 | 0 | 0.00 |
| Steers | 217 | 0 | 0 | 0.00 |
| **TOTAL** | **2,393** | **2** | **3** | **0.13** |

**Table 16b. Sulfonamides Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Production Class | Compound Class | Residue | Tissue | Result (ppm) |
|---|---|---|---|---|
| Non-Formula-Fed Veal | Sulfonamides | Sulfamethazine | Liver | 0.33 |
| Bob Veal | Sulfonamides | Sulfamethazine | Liver | 6.4 |
| Formula-Fed Veal | Sulfonamides | Sulfadimethoxine | Muscle | 0.13 |

[1] http://www.merckmanuals.com/professional/infectious_diseases/bacteria_and_antibacterial_drugs/sulfonamides.html

**Figure 15 Sulfonamides Summary**
**2011 Domestic Scheduled Sampling Results**

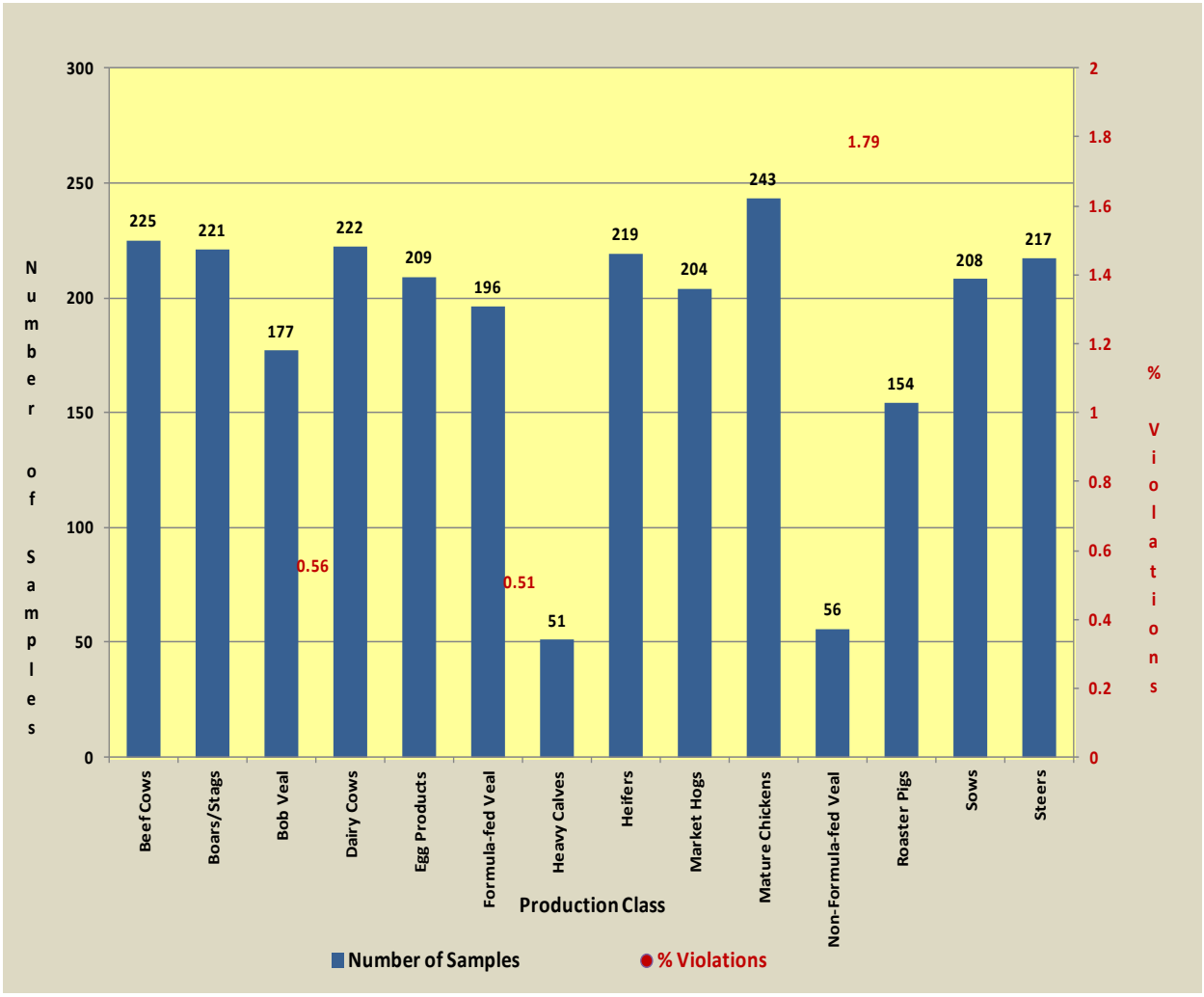


**Table 17. Distribution of Non-Violative Positive Samples by Chemical Class and Product Class-2011 Domestic Scheduled Sampling Results**

| Product Class | Antibiotics | Arsenic | Avermectins | *beta*-Agonists | Carbadox | Flunixin | Pesticides | Sulfonamides | Total |
|---|---|---|---|---|---|---|---|---|---|
| Beef Cows | 3 | - | 10 | - | - | - | - | - | **13** |
| Boar/Stags | 1 | - | - | - | - | - | - | - | **1** |
| Bob Veal | 3 | - | - | - | - | - | - | - | **3** |
| Dairy Cows | 2 | - | 2 | - | - | 1 | - | - | **5** |
| Formula-Fed Veal | 10 | - | 10 | - | - | - | - | 2 | **22** |
| Heavy Calves | 4 | - | - | - | - | - | - | - | **4** |
| Lambs | 3 | - | - | - | - | - | - | - | **3** |
| Market Hogs | 1 | - | - | 1 | - | - | - | - | **2** |
| Mature Sheep | 2 | - | 4 | - | - | - | - | - | **6** |
| Mature Turkeys | 1 | 4 | - | - | - | - | - | - | **5** |
| Non-Formula-Fed Veal | - | - | 1 | - | - | - | - | - | **1** |
| Roaster Pigs | 4 | - | - | - | 1 | - | 2 | - | **7** |
| Sows | - | - | - | - | - | - | 1 | - | **1** |
| Steers | - | - | 3 | 2 | - | - | 1 | - | **6** |
| Young Chickens | 5 | 61 | - | - | - | - | - | - | **66** |
| Young Turkeys | 8 | 2 | - | - | - | - | - | - | **10** |
| **TOTAL** | **47** | **67** | **30** | **3** | **1** | **1** | **4** | **2** | **155** |

**Table 18. Distribution of Non-Violative Positive Samples by Chemical Residue and Product Class-2011 Domestic Scheduled Sampling Results**

| Product Class | Arsenic | Carbadox | Chlortetracycline | DDT And Metabolites | Doramectin | Flunixin | Ivermectin | Moxidectin | Neomycin | Oxytetracycline | Penicillin | Piperonyl Butoxide | Ractopamine | Sulfadimethoxine | Tetracycline | Tetracycline positive | Tilmicosin | Tulathromycin | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Beef Cows | - | - | - | - | 2 | - | 6 | 2 | - | 1 | - | - | - | - | - | 1 | 1 | - | **13** |
| Boar/Stags | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | **1** |
| Bob Veal | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | 1 | - | - | **3** |
| Dairy Cows | - | - | - | - | - | 1 | 1 | 1 | - | - | 2 | - | - | - | - | - | - | - | **5** |
| Formula fed-Veal | - | - | 1 | - | - | - | 10 | - | 2 | - | - | - | - | 2 | 1 | 6 | - | - | **22** |
| Heavy Calves | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | 3 | **4** |
| Lambs | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | **3** |
| Market Hogs | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | **2** |
| Mature Sheep | - | - | - | - | - | - | 1 | 3 | - | - | - | - | - | - | - | 2 | - | - | **6** |
| Mature Turkeys | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | **5** |
| Non-Formula fed Veal | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Roaster Pigs | - | 1 | - | 1 | - | - | - | - | 1 | - | - | 1 | - | - | - | 3 | - | - | **7** |
| Sows | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Steers | - | - | - | 1 | 1 | - | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | **6** |
| Young Chickens | 61 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | **66** |
| Young Turkeys | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8 | - | - | **10** |
| **Total** | **67** | **1** | **4** | **3** | **3** | **1** | **20** | **7** | **7** | **1** | **2** | **1** | **3** | **2** | **1** | **28** | **1** | **3** | **155** |

## DOMESTIC SAMPLING RESULTS: Production Class Data

Tables 19–39 contain information obtained from the FSIS DW and PHIS. These tables list summary and detailed results by production class.

Tables 19a–39a contain a summary of domestic scheduled sampling results and provide the number of samples analyzed by compound class. Column 1 lists the compound class; column 2, the number of samples; column 3, the number of non-violative positives (e.g., compounds detected at a level equal to or below the established tolerance); column 4, the number of violations; and column 5, the percent of violations for each compound class. Because multiple compounds can be analyzed on the same sample, one sample (e.g., one animal or a composite from one poultry flock) may have more than one violation. The summary data appear as a series of bar charts.

Tables 19–39b summarizes violation results by production class. These include chemical compound class (column 1), chemical residue (column 2), tissue type (column 3), and residue detected results in ppb or ppm (columns 4 and 5). These tables are contingent on violations being detected. Tables are only provided for compound classes with residue violations (b). Code 8888 is used for violative results, and code 9999 is for non-violative results.

**Beef Cows**

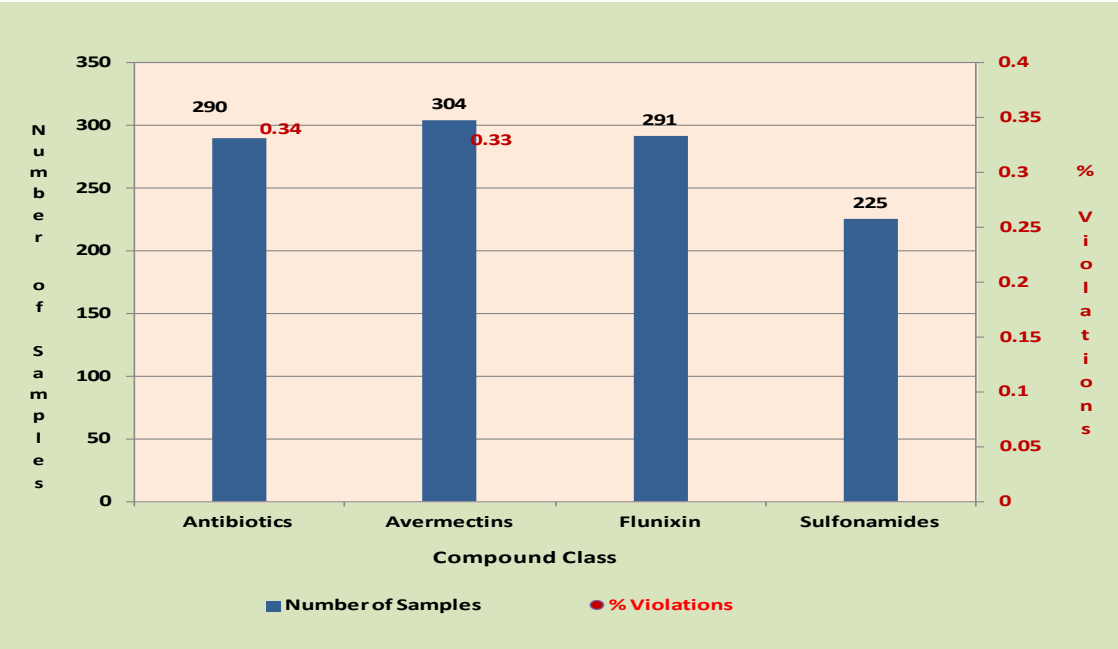
**Table 19a. Beef Cows Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 290 | 3 | 1 | 0.34 |
| Avermectins | 304 | 10 | 1 | 0.33 |
| Flunixin | 291 | 0 | 0 | 0.00 |
| Sulfonamides | 225 | 0 | 0 | 0.00 |
| **TOTAL** | **1,110** | **13** | **2** | **0.18** |

**Table 19b. Beef Cows Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Antibiotics | Penicillin | Kidney | 0.09 | ppm |
| Avermectins | Doramectin | Liver | 230.25 | ppb |

**Figure 16. Beef Cows Summary**
**2011 Domestic Scheduled Sampling Results**



**Boars/Stags**

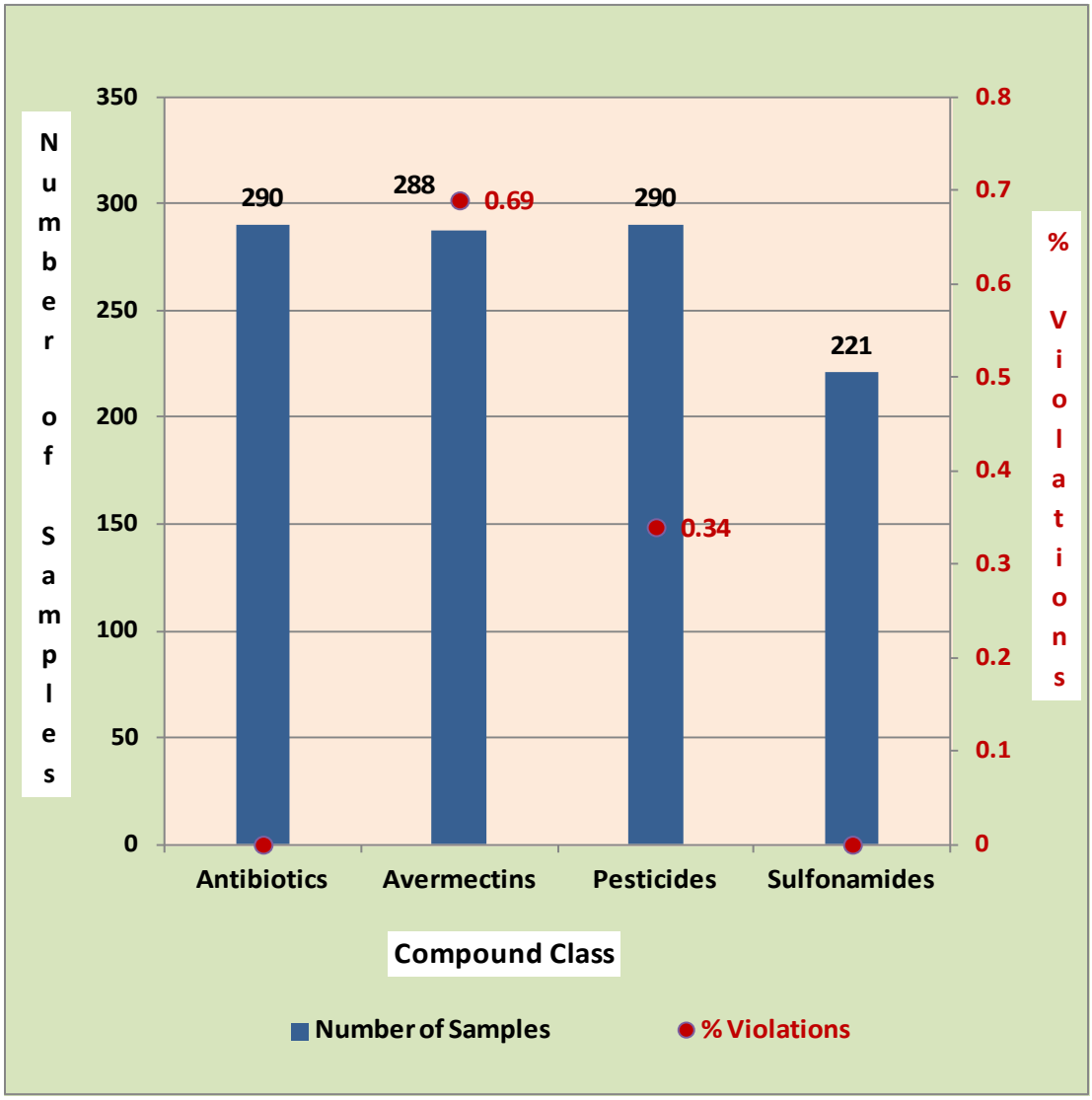
**Table 20a. Boars/Stags Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 290 | 1 | 0 | 0.00 |
| Avermectins | 288 | 0 | 2 | 0.69 |
| Pesticides | 290 | 0 | 1 | 0.34 |
| Sulfonamides | 221 | 0 | 0 | 0.00 |
| **TOTAL** | **1,089** | **1** | **3** | **0.28** |

**Table 20b. Boars/Stags Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Avermectins | Doramectin | Liver | 346.25 | ppb |
| Avermectins | Ivermectin | Liver | 20.75 | ppb |
| Pesticides | Piperonyl Butoxide | Muscle | 0.117 | ppm |

**Figure 17. Boars/Stags Summary**
**2011 Domestic Scheduled Sampling Results**



**Bob Veal**

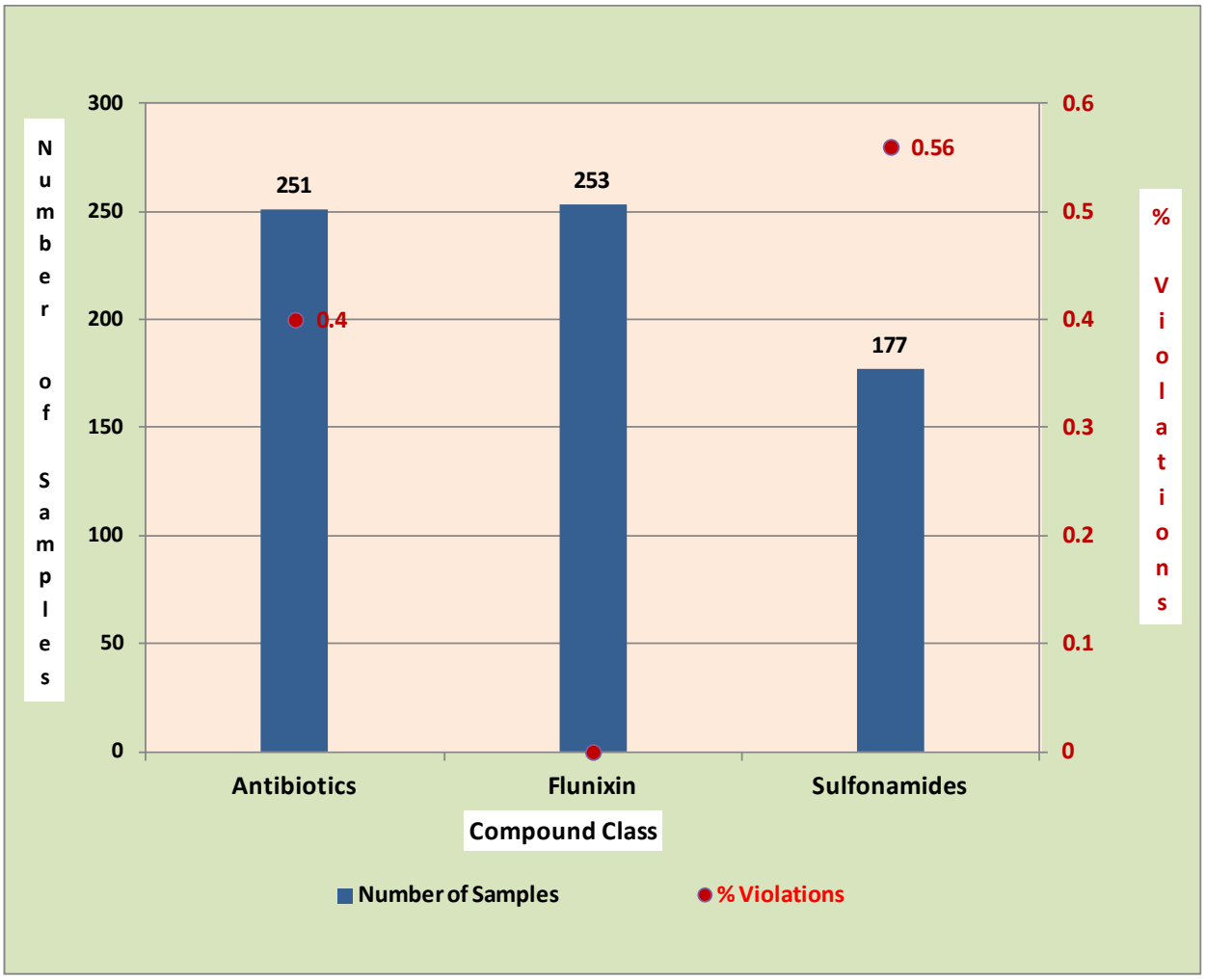
**Table 21a. Bob Veal Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 251 | 3 | 1 | 0.40 |
| Flunixin | 253 | 0 | 0 | 0.00 |
| Sulfonamides | 177 | 0 | 1 | 0.56 |
| **TOTAL** | **681** | **3** | **2** | **0.29** |

**Table 21b. Bob Veal Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Antibiotics | Neomycin | Kidney | 19.6 | ppm |
| Sulfonamides | Sulfamethazine | Liver | 6.4 | ppm |

**Figure 18. Bob Veal Summary**
**2011 Domestic Scheduled Sampling Results**



**Dairy Cows**

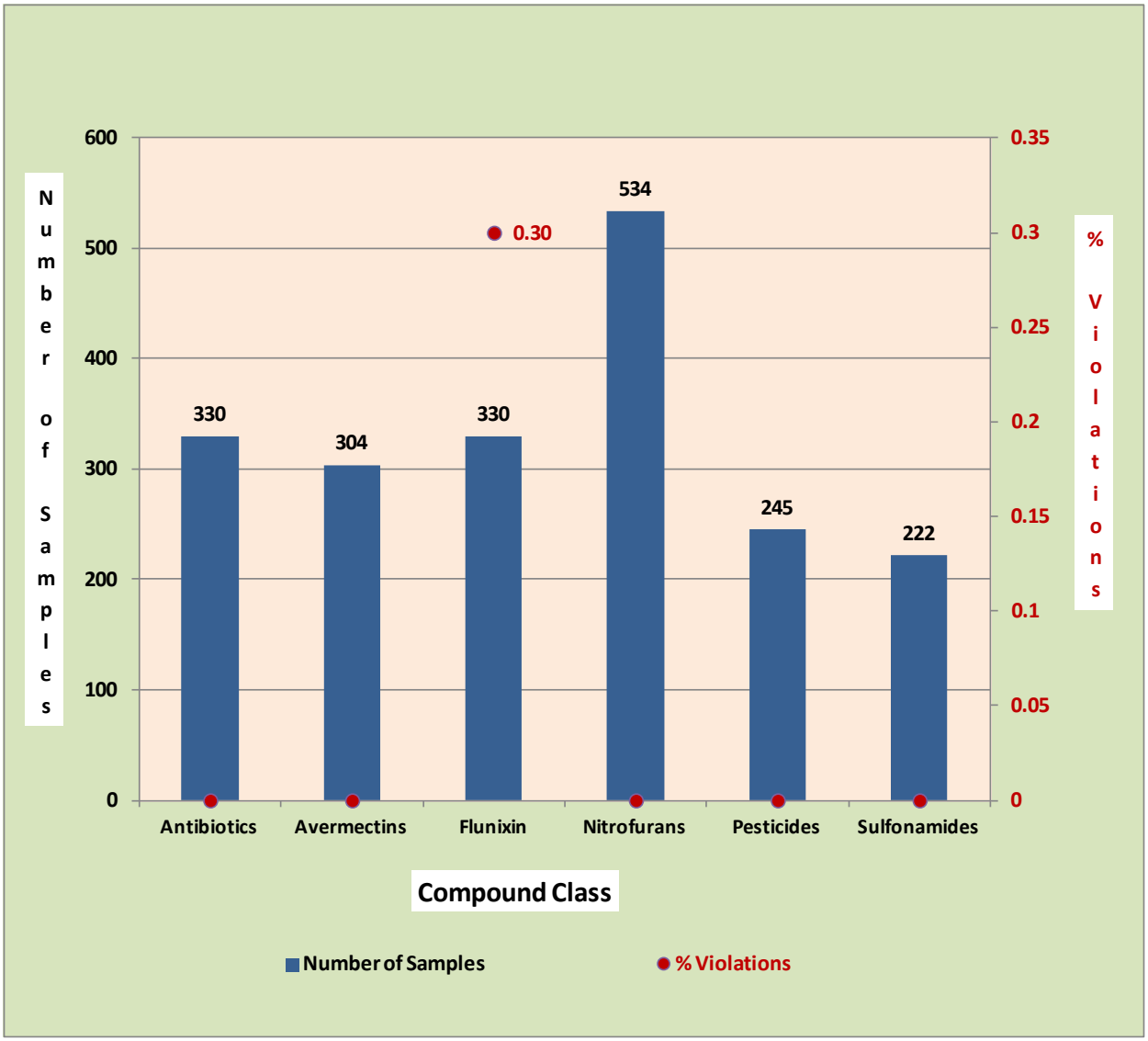
**Table 22a. Dairy Cows Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 330 | 2 | 0 | 0.00 |
| Avermectins | 304 | 2 | 0 | 0.00 |
| Flunixin | 330 | 1 | 1 | 0.30 |
| Nitrofurans | 534 | 0 | 0 | 0.00 |
| Pesticides | 245 | 0 | 0 | 0.00 |
| Sulfonamides | 222 | 0 | 0 | 0.00 |
| **TOTAL** | **1,965** | **5** | **1** | **0.05** |

**Table 22b. Dairy Cows Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Flunixin | Flunixin | Liver | 0.209 | ppm |

**Figure 19. Dairy Cows Summary**
**2011 Domestic Scheduled Sampling Results**




**Ducks**
**2011 Domestic Scheduled Sampling Results**

Ducks were tested for antibiotics in kidney tissue. No violations or non-violative positives were detected in 50 samples.

**Formula-Fed Veal**

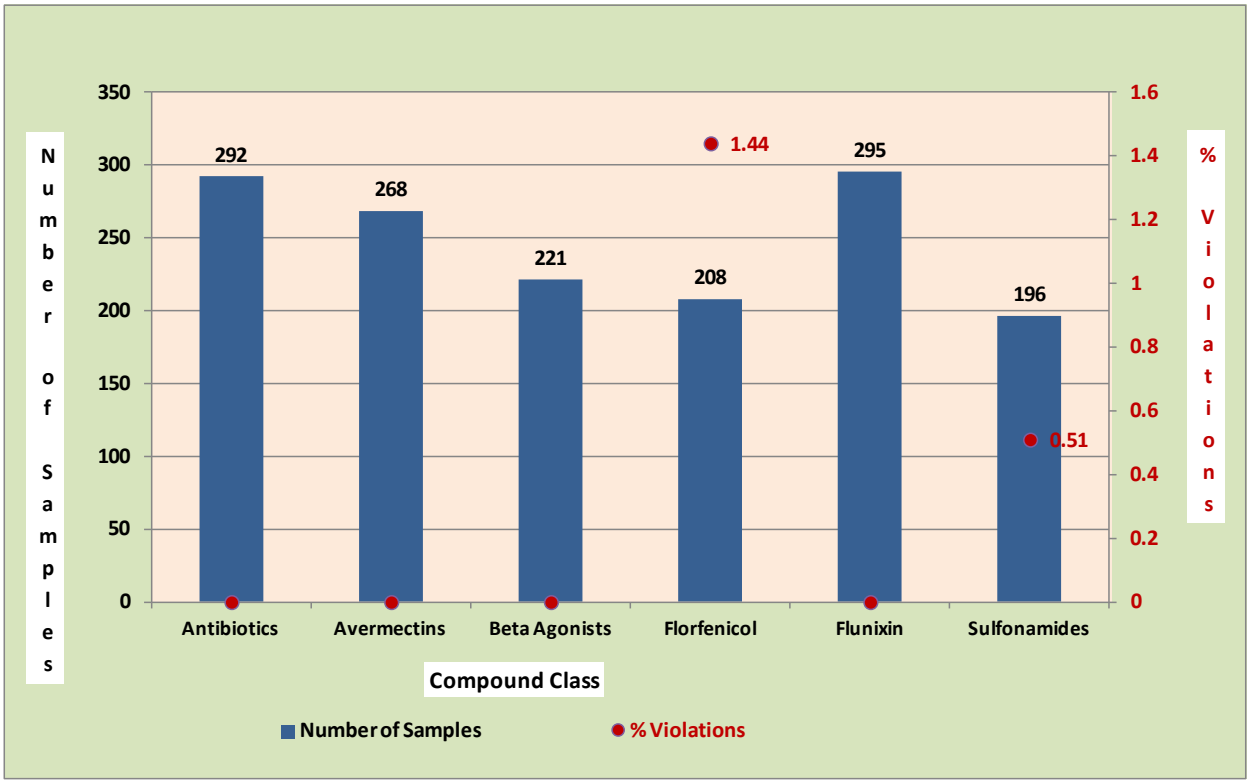
**Table 23a. Formula-Fed Veal Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 292 | 10 | 0 | 0.00 |
| Avermectins | 268 | 10 | 0 | 0.00 |
| *beta*-Agonists | 221 | 0 | 0 | 0.00 |
| Florfenicol | 208 | 0 | 3 | 1.44 |
| Flunixin | 295 | 0 | 0 | 0.00 |
| Sulfonamides | 196 | 2 | 1 | 0.51 |
| **TOTAL** | **1,480** | **22** | **4** | **0.27** |

**Table 23b. Formula-Fed Veal Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Florfenicol | Florfenicol | Liver | 0.3 | ppb |
| Florfenicol | Florfenicol | Liver | 0.53 | ppb |
| Florfenicol | Florfenicol | Liver | 0.5 | ppb |
| Sulfonamides | Sulfadimethoxine | Muscle | 0.13 | ppm |

**Figure 20. Formula-fed Veal Summary**
**2011 Domestic Scheduled Sampling Results**




**Geese**

**Table 24a. Geese Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 11 | 0 | 0 | 0.00 |
| **TOTAL** | **11** | **0** | **0** | **0.00** |

## Goats

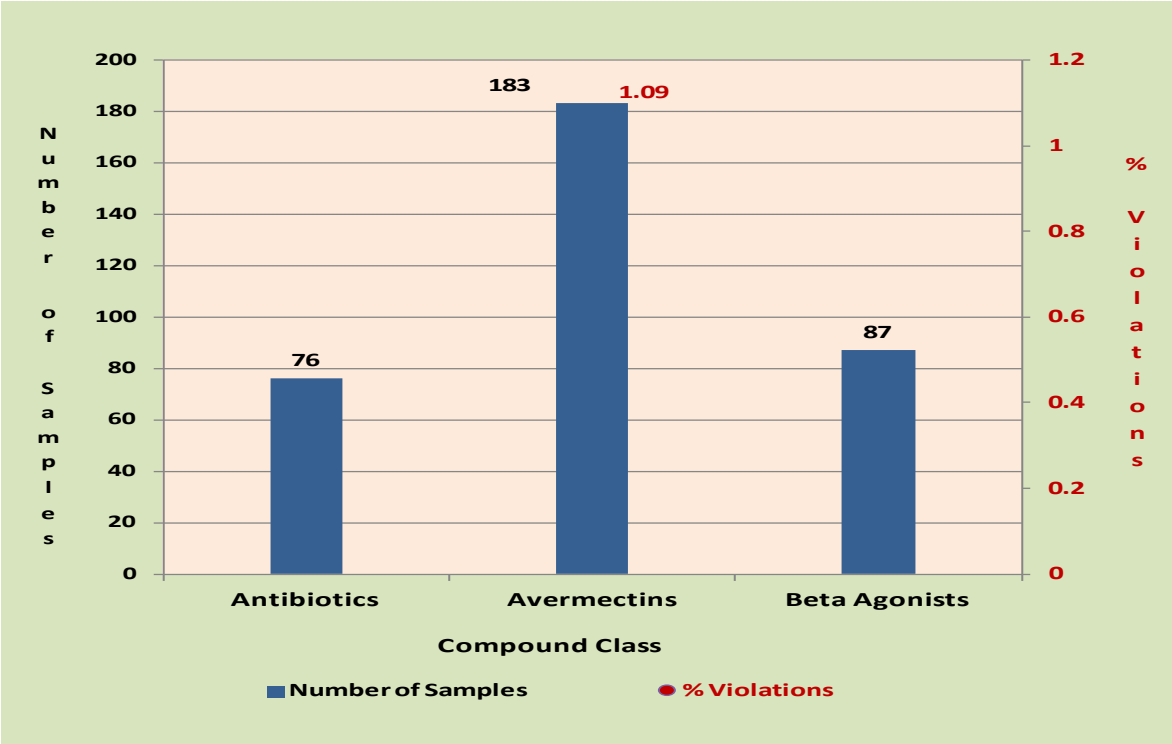
**Table 25a. Goats Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| **Antibiotics** | 76 | 0 | 0 | 0.00 |
| **Avermectins** | 183 | 0 | 2 | 1.09 |
| ***beta*-Agonists** | 87 | 0 | 0 | 0.00 |
| **TOTAL** | **346** | **0** | **2** | **0.58** |

**Table 25b. Goats Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Avermectins | Moxidectin | Liver | 56.4 | ppb |
| | | | 53.8 | ppb |

**Figure 21. Goats Summary**
**2011 Domestic Scheduled Sampling Results**

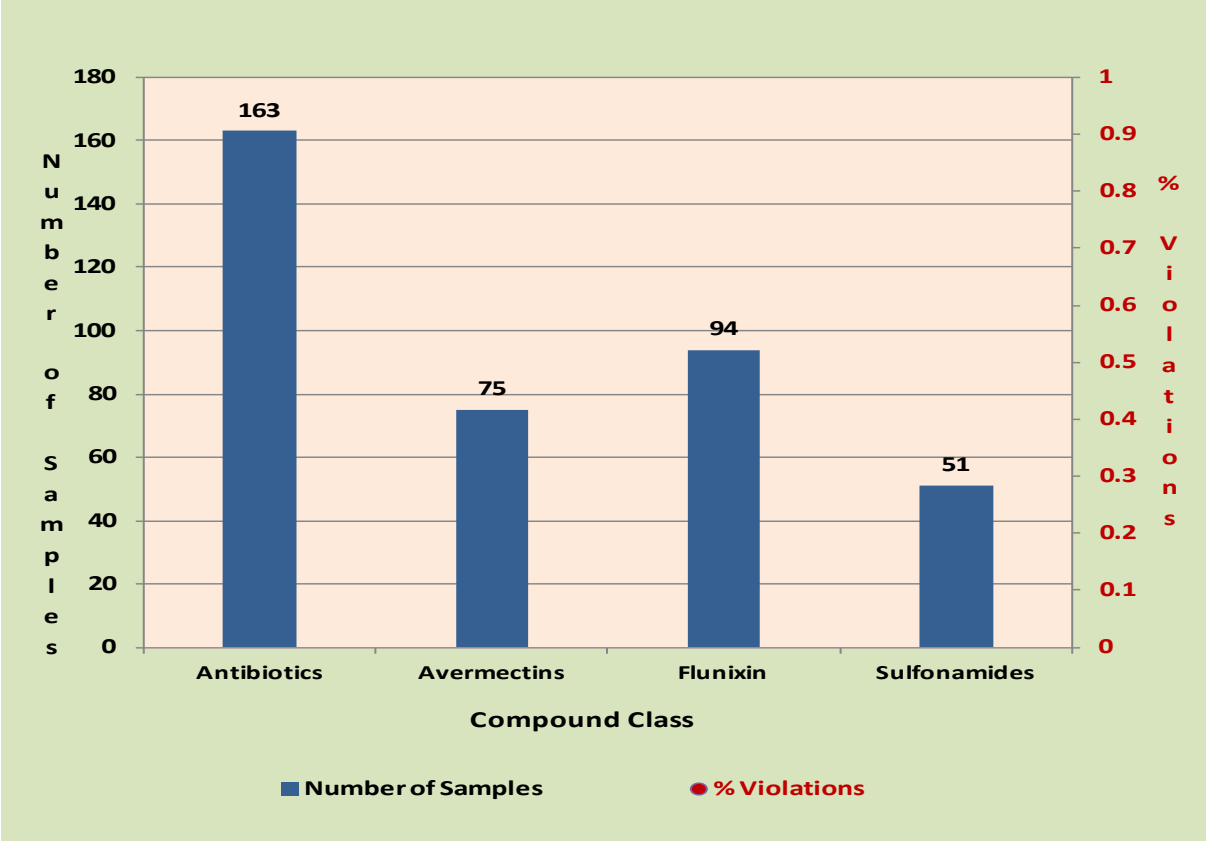


**Heavy Calves**

**Table 26a. Heavy Calves Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 163 | 4 | 0 | 0.00 |
| Avermectins | 75 | 0 | 0 | 0.00 |
| Flunixin | 94 | 0 | 0 | 0.00 |
| Sulfonamides | 51 | 0 | 0 | 0.00 |
| **TOTAL** | **383** | **4** | **0** | **0.00** |

**Figure 22. Heavy Calves Summary**
**2011 Domestic Scheduled Sampling Results**

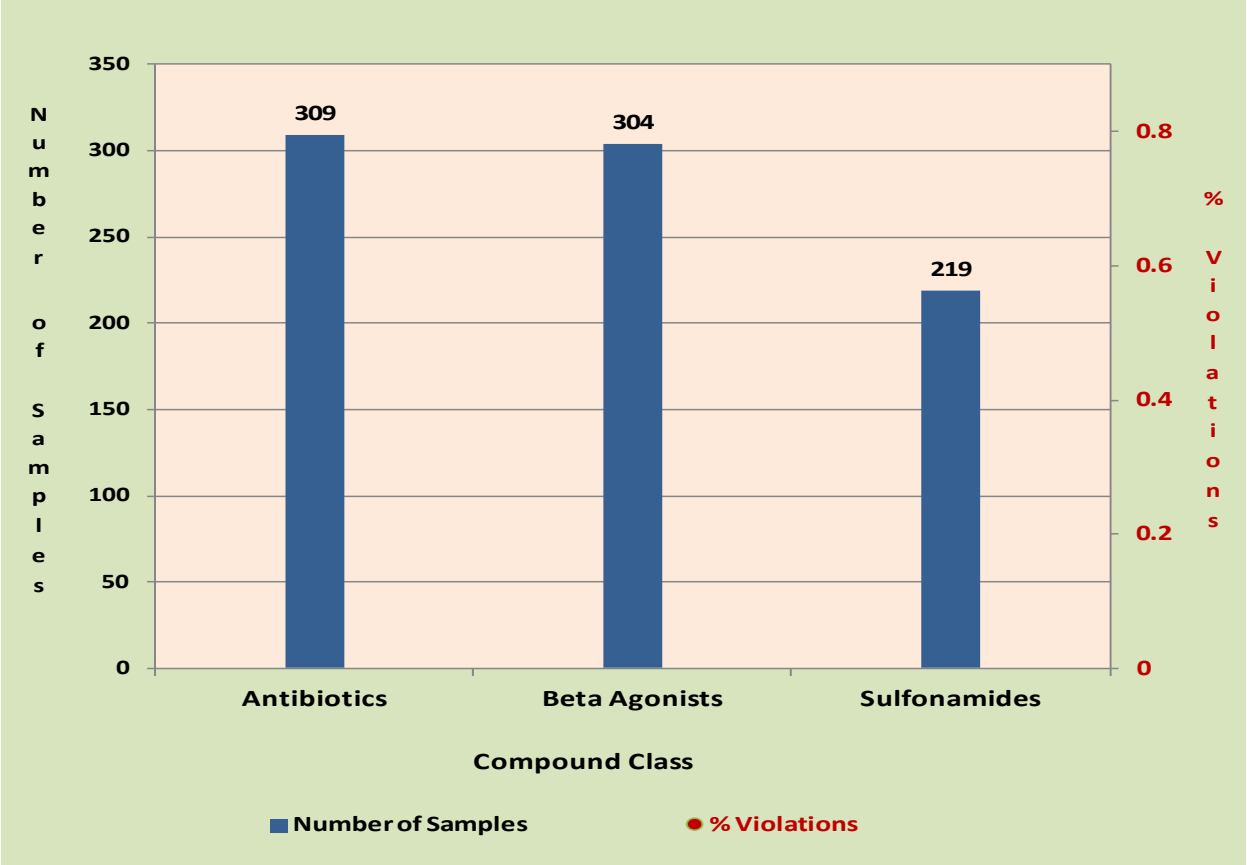


**Heifers**

**Table 27a. Heifers Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 309 | 0 | 0 | 0.00 |
| *beta*-Agonists | 304 | 0 | 0 | 0.00 |
| Flunixin | 1 | 0 | 0 | 0.00 |
| Sulfonamides | 219 | 0 | 0 | 0.00 |
| **TOTAL** | **833** | **0** | **0** | **0.00** |

**Figure 23. Heifers Summary**
**2011 Domestic Scheduled Sampling Results**



**Lambs**

**Table 28a. Lambs Summary**
**2011 Domestic Scheduled Sampling Results**

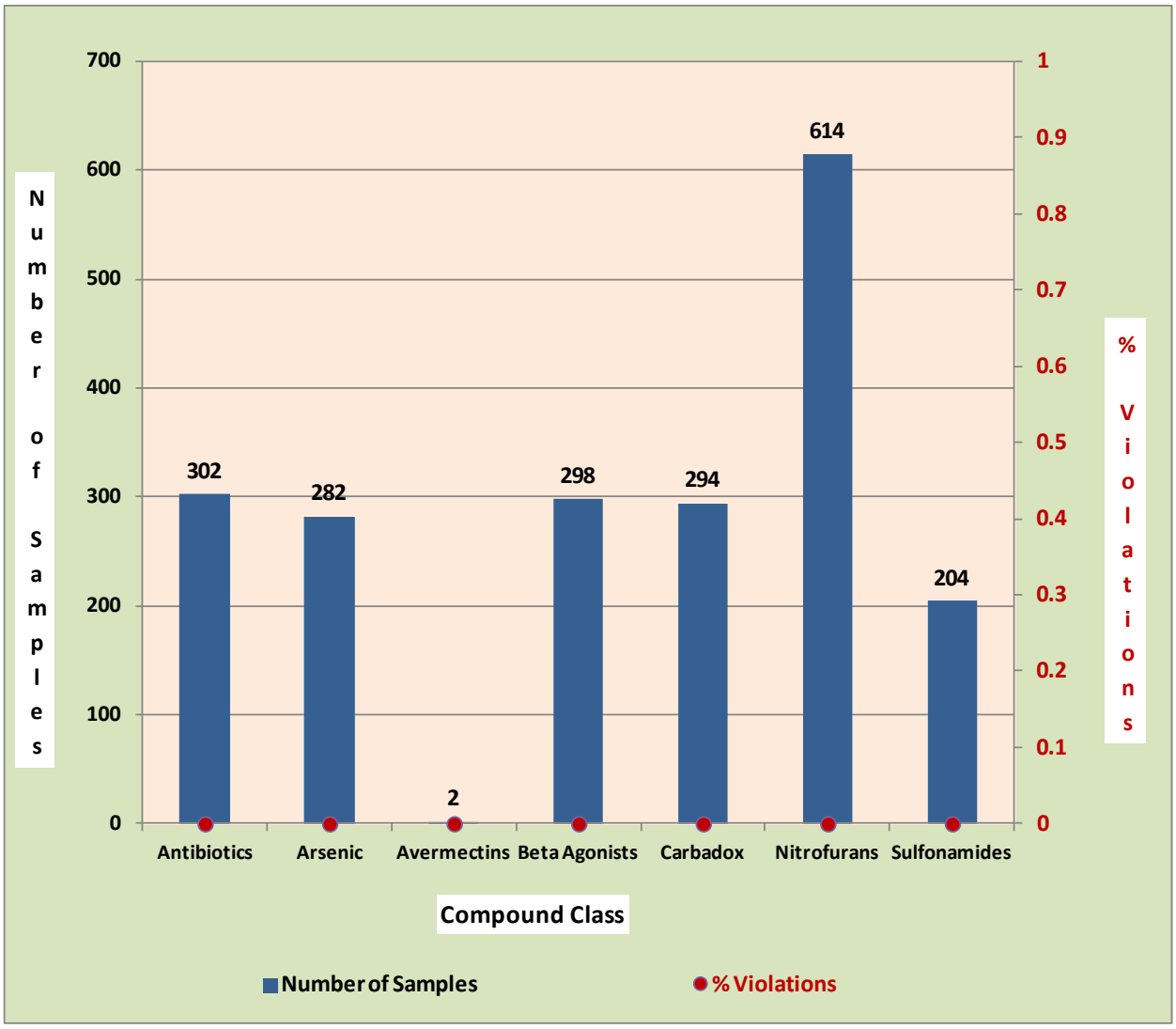
| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 229 | 3 | 0 | 0.00 |
| **TOTAL** | **229** | **3** | **0** | **0.00** |

**Market Hogs**

**Table 29a. Market Hogs Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 302 | 1 | 0 | 0.00 |
| Arsenic | 282 | 0 | 0 | 0.00 |
| Avermectins | 2 | 0 | 0 | 0.00 |
| *beta*-Agonists | 298 | 1 | 0 | 0.00 |
| Carbadox | 294 | 0 | 0 | 0.00 |
| Nitrofurans | 614 | 0 | 0 | 0.00 |
| Sulfonamides | 204 | 0 | 0 | 0.00 |
| **TOTAL** | **1,996** | **2** | **0** | **0.00** |

**Figure 24 Market Hogs Summary**
**2011 Domestic Scheduled Sampling Results**



## Mature Chickens

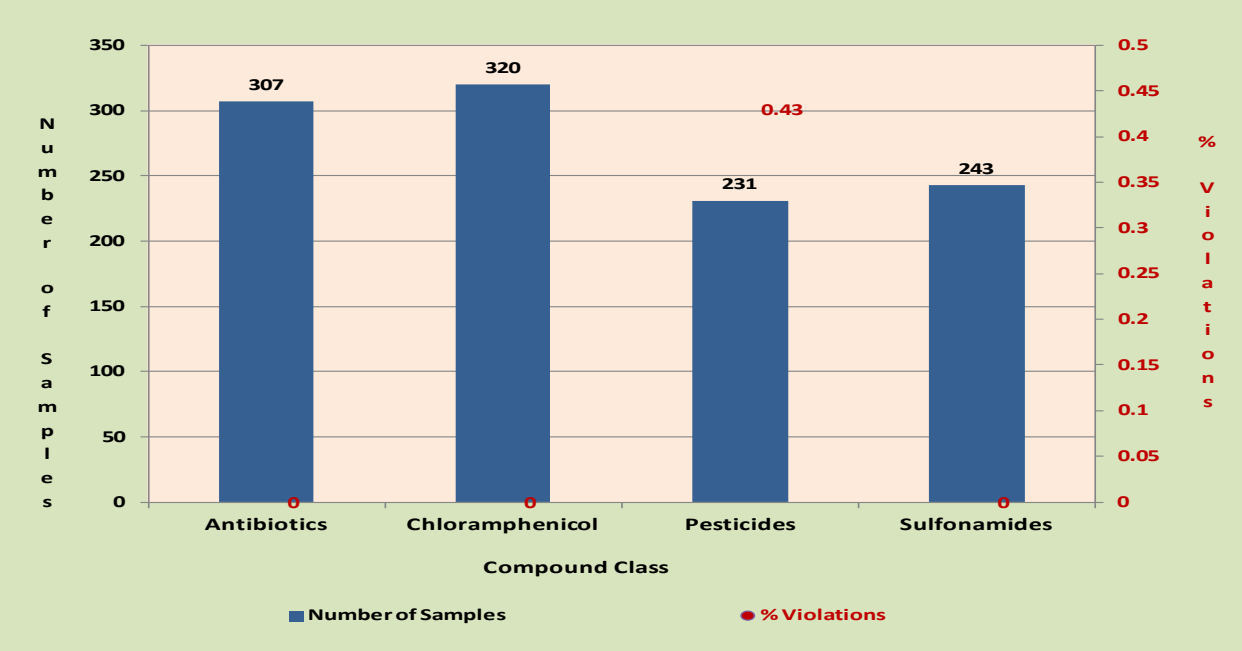
**Table 30a. Mature Chickens Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 307 | 0 | 0 | 0.00 |
| Chloramphenicol | 320 | 0 | 0 | 0.00 |
| Pesticides | 231 | 0 | 1 | 0.43 |
| Sulfonamides | 243 | 0 | 0 | 0.00 |
| **TOTAL** | **1,101** | **0** | **1** | **0.09** |

**Table 30b. Mature Chickens Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Pesticides | Carbaryl | Muscle | 8888* | none |

**Figure 25. Mature Chicken Summary**
**2011 Domestic Scheduled Sampling Results**




*8888 means detected, violative, but not quantified.

## Mature Sheep

**Table 31a. Mature Sheep Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 223 | 2 | 0 | 0.00 |
| Avermectins | 228 | 4 | 1 | 0.44 |
| **TOTAL** | **451** | **6** | **1** | **0.22** |

**Table 31b. Mature Sheep Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Avermectins | Doramectin | Liver | 52.85 | ppb |

## Mature Turkeys

**Table 32a. Mature Turkeys Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 203 | 1 | 0 | 0.00 |
| Arsenic | 207 | 4 | 0 | 0.00 |
| Chloramphenicol | 211 | 0 | 0 | 0.00 |
| **TOTAL** | **621** | **5** | **0** | **0.00** |

**Non-Formula-Fed Veal**

**Table 32a. Non-Formula-Fed Veal Summary**
**2011 Domestic Scheduled Sampling Results**

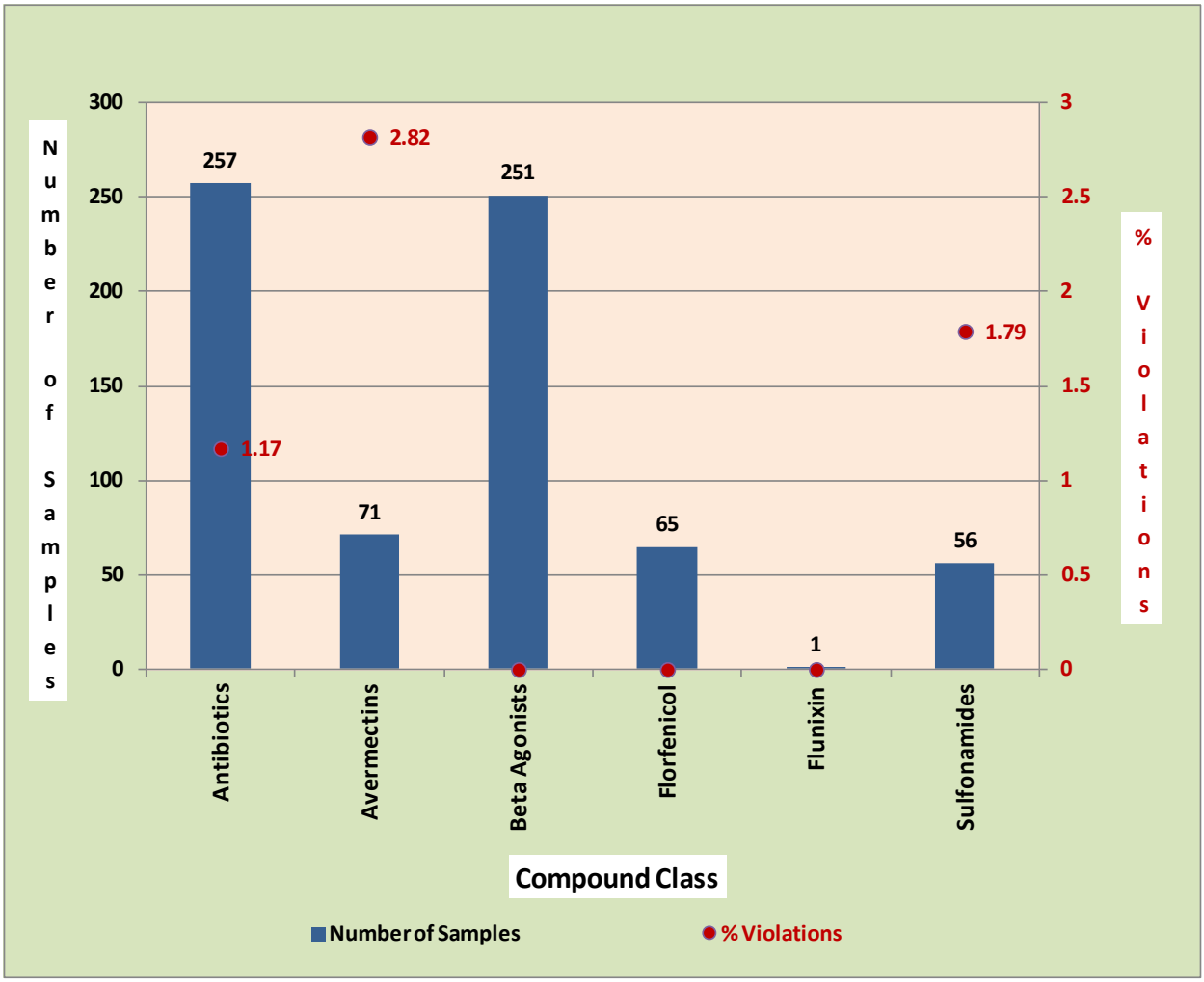
| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 257 | 0 | 3 | 1.17 |
| Avermectins | 71 | 1 | 2 | 2.82 |
| *beta*-Agonists | 251 | 0 | 0 | 0.00 |
| Florfenicol | 65 | 0 | 0 | 0.00 |
| Flunixin | 1 | 0 | 0 | 0.00 |
| Sulfonamides | 56 | 0 | 1 | 1.79 |
| **TOTAL** | **701** | **1** | **6** | **0.86** |

**Table 33b. Non-Formula-Fed Veal Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Antibiotics | Tilmicosin | Liver | 12.082 | ppm |
| Antibiotics | Tulathromycin | Kidney | 8888* | none |
| Antibiotics | Tulathromycin | Kidney | 8888* | none |
| Avermectins | Moxidectin | Liver | 15 | ppb |
| Avermectins | Doramectin | Liver | 32.8 | ppb |
| Sulfonamides | Sulfamethazine | Liver | 0.33 | ppm |

*8888 means detected, violative, but not quantified.

**Figure 26. Non-Formula-Fed Veal Summary**
**2011 Domestic Scheduled Sampling Results**



**Rabbits**

**Table 34a. Rabbits Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 4 | 0 | 0 | 0.00 |
| **TOTAL** | **4** | **0** | **0** | **0.00** |

**Roaster Pigs**

**Table 35a. Roaster Pigs Summary**
**2011 Domestic Scheduled Sampling Results**

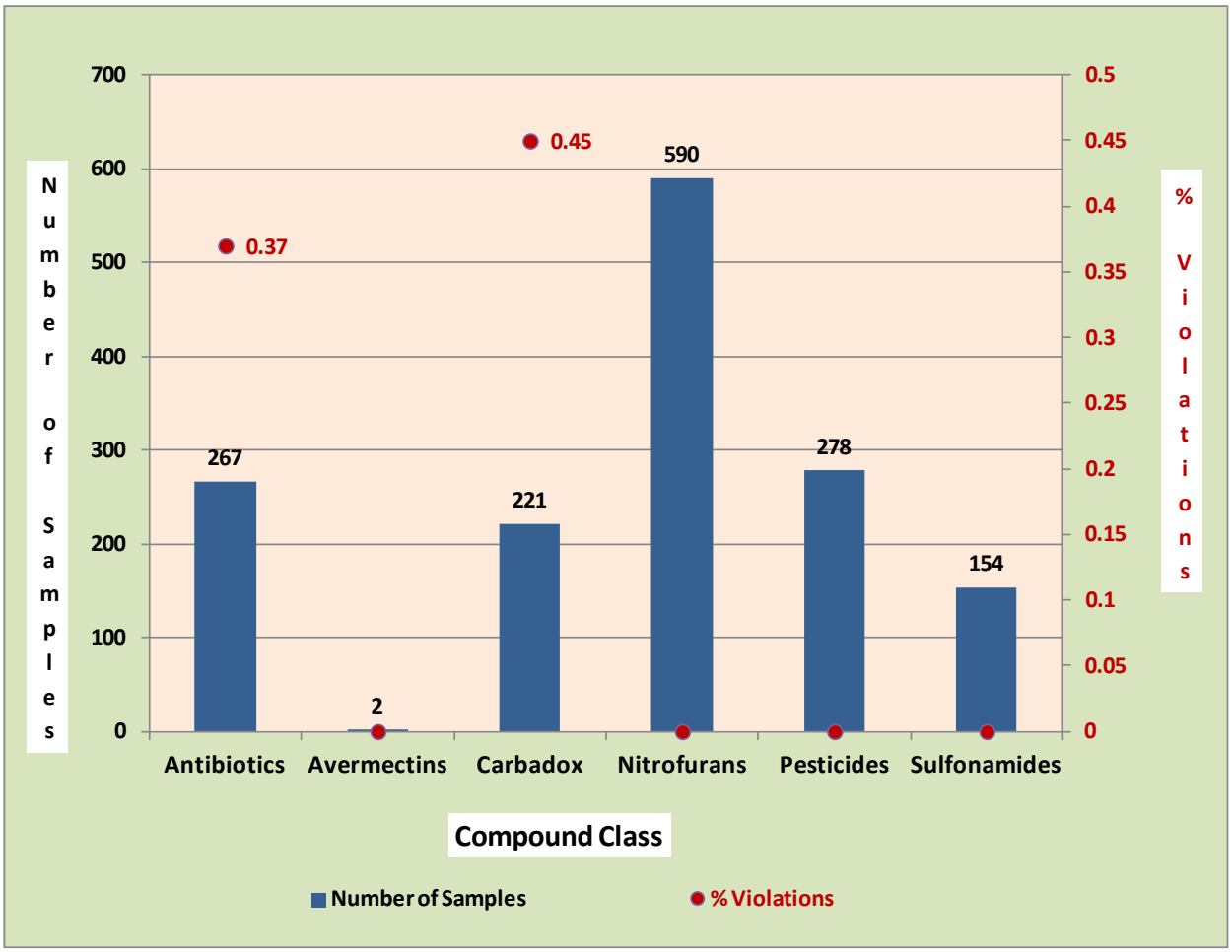
| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 267 | 4 | 1 | 0.37 |
| Avermectins | 2 | 0 | 0 | 0.00 |
| Carbadox | 221 | 1 | 1 | 0.45 |
| Nitrofurans | 590 | 0 | 0 | 0.00 |
| Pesticides | 278 | 2 | 0 | 0.00 |
| Sulfonamides | 154 | 0 | 0 | 0.00 |
| **TOTAL** | **1,512** | **7** | **2** | **0.13** |

**Table 35b. Roaster Pigs Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Antibiotics | Penicillin | Kidney | 8888* | none |
| Carbadox | Carbadox | Liver | 115.471 | ppb |

*8888 means detected, violative, but not quantified.

**Figure 27. Roaster Pigs Summary**
**2011 Domestic Scheduled Sampling Results**



**Sows**

**Table 37a. Sows Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 305 | 0 | 2 | 0.66 |
| Pesticides | 294 | 1 | 0 | 0.00 |
| Sulfonamides | 208 | 0 | 0 | 0.00 |
| **TOTAL** | **807** | **1** | **2** | **0.25** |

**Table 36b. Sows Violations Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Antibiotics | Penicillin | Kidney | 8888* | none |
| Antibiotics | Penicillin | Kidney | 8888* | none |

*8888 means detected, violative, but not quantified.

**Figure 28. Sows Summary**
**2011 Domestic Scheduled Sampling Results**

**Steers**

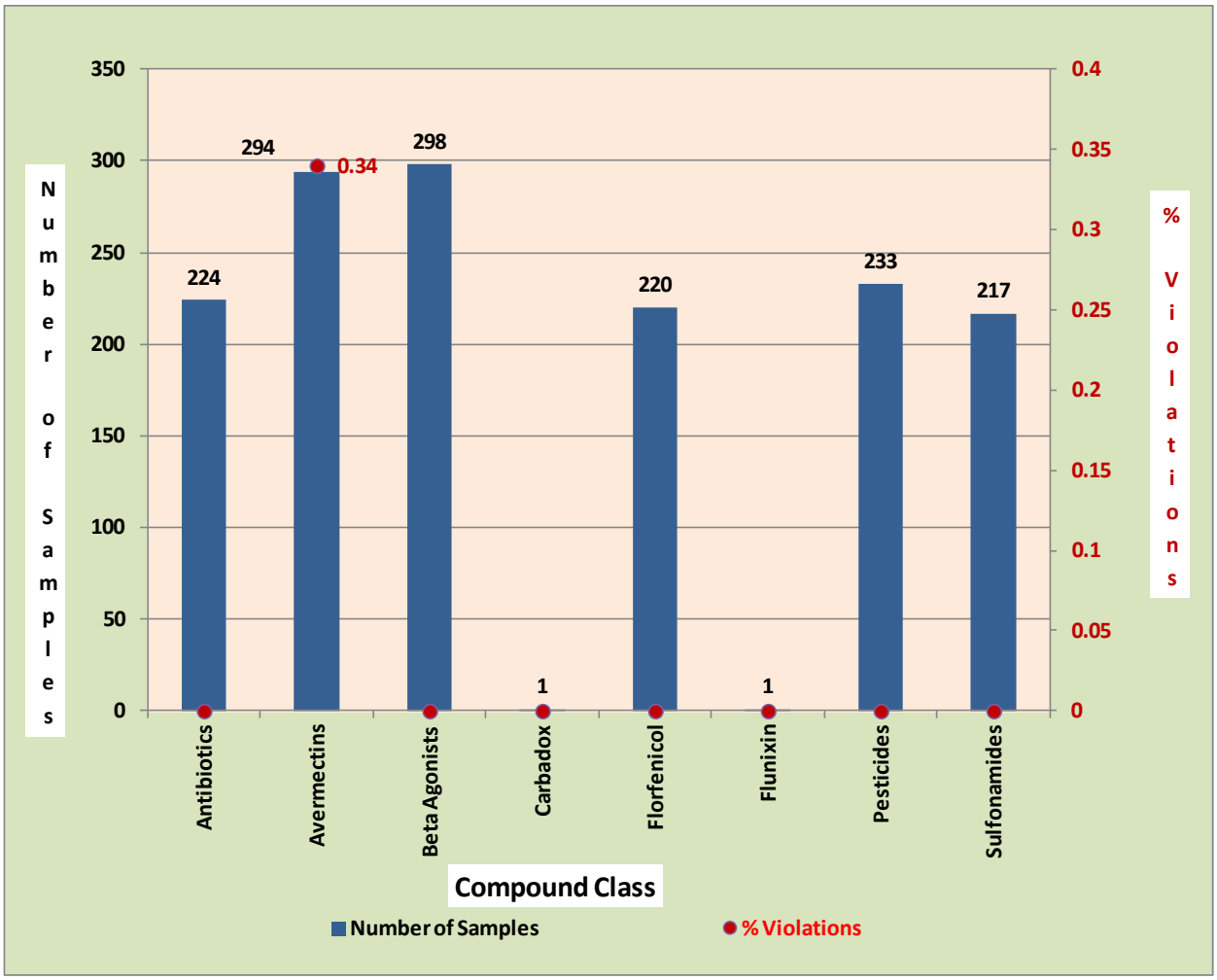
**Table 37a. Steers Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 224 | 0 | 0 | 0.00 |
| Avermectins | 294 | 3 | 1 | 0.34 |
| *beta*-Agonists | 298 | 2 | 0 | 0.00 |
| Carbadox | 1 | 0 | 0 | 0.00 |
| Florfenicol | 220 | 0 | 0 | 0.00 |
| Flunixin | 1 | 0 | 0 | 0.00 |
| Pesticides | 233 | 1 | 0 | 0.00 |
| Sulfonamides | 217 | 0 | 0 | 0.00 |
| **TOTAL** | **1,488** | **6** | **1** | **0.07** |

**Table 37b. Steers Violation Report**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Residue | Tissue | Result | Unit |
|---|---|---|---|---|
| Avermectins | Ivermectin | Liver | 115.5 | ppb |

**Figure 29. Steers Summary**
**2011 Domestic Scheduled Sampling Results**

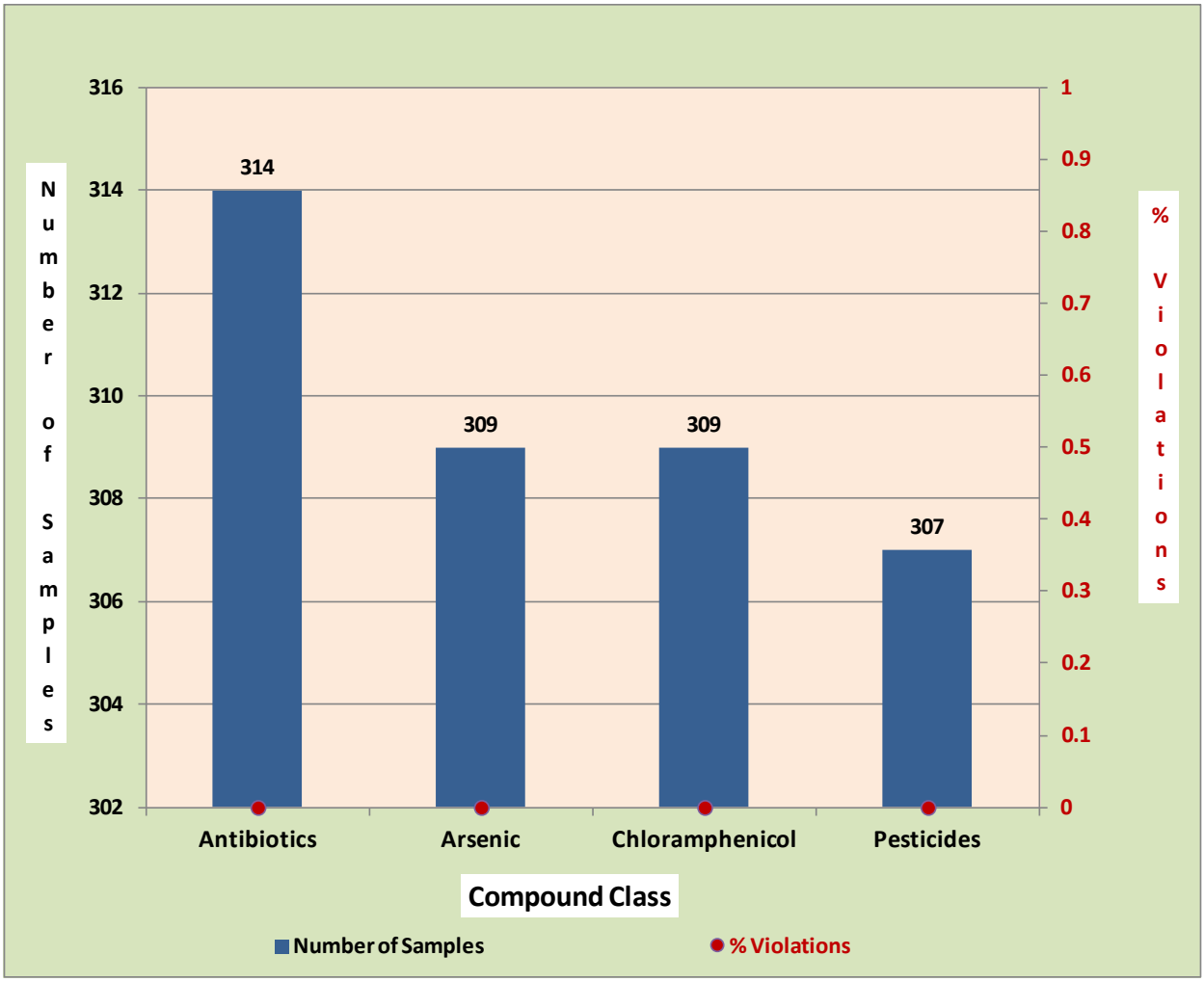


**Young Chickens**

**Table 38a. Young Chickens Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 314 | 5 | 0 | 0.00 |
| Arsenic | 309 | 61 | 0 | 0.00 |
| Chloramphenicol | 309 | 0 | 0 | 0.00 |
| Pesticides | 307 | 0 | 0 | 0.00 |
| **TOTAL** | **1,239** | **66** | **0** | **0.00** |

**Figure 30. Young Chickens Summary**
**2011 Domestic Scheduled Sampling Results**

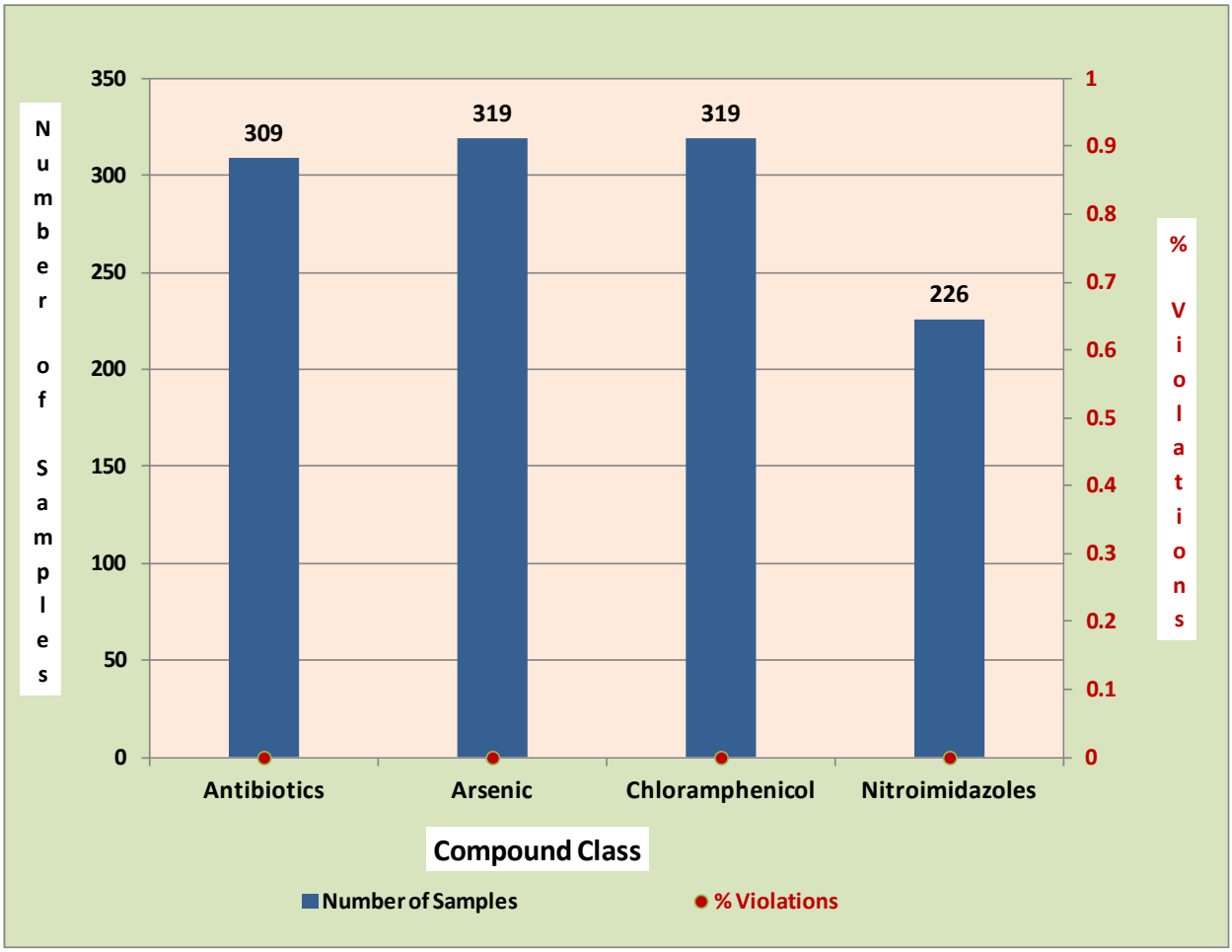


**Young Turkeys**

**Table 39a. Young Turkeys Summary**
**2011 Domestic Scheduled Sampling Results**

| Compound Class | Number of Samples | Number of Non-violative Positives | Number of Violations | Percent Violations |
|---|---|---|---|---|
| Antibiotics | 309 | 8 | 0 | 0.00 |
| Arsenic | 319 | 2 | 0 | 0.00 |
| Chloramphenicol | 319 | 0 | 0 | 0.00 |
| Nitroimidazoles | 226 | 0 | 0 | 0.00 |
| **TOTAL** | **1,173** | **10** | **0** | **0.00** |

**Figure 31. Young Turkeys Summary**
**2011 Domestic Scheduled Sampling Results**



**Egg Products**
**2011 Domestic Scheduled Sampling Results**

Egg products were tested for sulfonamides. No violations or non-violative positives were detected in the 497 tested samples.

## Scheduled Sampling – Targeted Assessments

## Environmental Contaminants (Cadmium and Lead)

In 2011, FSIS conducted a survey of the prevalence of cadmium and lead in market hogs (546 samples: 273 cadmium and 273 lead tests). Muscle and kidney samples with cadmium levels below the Minimum Proficiency Level[9] (i.e., 10 ppb for cadmium and 25 ppb for lead) are labeled as non-detect (ND) in Tables 40 and 41. Table 40 presents the number of positives and ND samples by metal and tissue analyzed. The left-hand columns show tissue type (kidney or muscle) for metals (cadmium and lead). The right-hand columns show the number of non-detected samples and number of positive samples.

**Table 40. Number of Positive and Non-detect Market Hogs Samples Analyzed for Cadmium and Lead, 2011 Targeted Assessments Results**

| Environmental Contaminants | | Samples | | |
|---|---|---|---|---|
| | | Non-detect | Positive[10] | Total |
| **Metal** | | | | |
| **Cadmium** | Kidney | 1 | 272 | 273 |
| | Muscle | 264 | 9 | 273 |
| | **Total for Cadmium** | **265** | **281** | **546** |
| **Lead** | Kidney | 243 | 30 | 273 |
| | Muscle | 272 | 1 | 273 |
| | **Total for Lead** | **415** | **31** | **546** |

[9] Minimum Proficiency Level: The minimum concentration of a residue at which an analytical result will be used to assess a laboratory's quantification capability.
[10] Positive samples have detectable Minimum Proficiency Levels above 10 ppb for cadmium and 25 ppb for lead.

Table 41 presents the statistical analysis of the cadmium and lead levels detected in dairy cow muscle and kidney samples. Left-hand columns show the number and percentage of positive samples. Right-hand columns in the table show the range, median, mean, standard deviation, and 95$^{th}$ percentile for the values. The values in red were calculated using the positive and non-detect samples. With these calculations, a default level of zero was used for non-detects (red). All other values presented in the table are applicable to positive samples only.

**Table 41. Statistical Analysis of Cadmium and Lead Levels in Kidneys and Muscles from Market Hogs, 2011 Targeted Assessments Results**

| Metal | Tissue | Number of Samples | Number of Positive Samples | Percent of Positive Samples | Levels Range (ppb) | Median Levels (ppb) | Mean Levels (ppb) | Standard Deviation | 95$^{th}$ percentile |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | Kidney | 273 | 272 | 99.63% | 20.78–731.9<br>**0.00–731.9** | 103.5<br>**102.6** | 133.1<br>**132.6** | 102.1<br>**102.6** | 332.3<br>**332.3** |
| Cadmium | Muscle | 273 | 9 | 3.30 % | 10.13–89.23<br>**0.00–89.23** | 11.60<br>**0.00** | 21.02<br>**0.69** | 25.69<br>**5.79** | 89.23<br>**0.00** |
| Lead | Kidney | 273 | 30 | 10.98 % | 25.58–248.1<br>**0.00–248.1** | 57.32<br>**0.00** | 78.52<br>**8.63** | 61.60<br>**31.78** | 225.6<br>**61.93** |
| Lead | Muscle | 273 | 1 | 0.36 % | 88.66<br>**0.00–88.66** | 88.66<br>**0.00** | 31.53<br>**0.32** | n/a<br>**5.37** | 88.66<br>**0.00** |

## INSPECTOR-GENERATED SAMPLING

Suspect Animals

PHVs, and CSIs under the guidance of a PHV, conduct inspector-generated sampling when an animal is suspected to have undergone drug treatment and possibly contains violative levels of chemical residues. Sample screening utilizes the FAST or the KIS™ test. If FAST supplies or KIS™ test kits are not available, the PHV submits the sample to the FSIS laboratory for testing. FSIS incorporated the KIS™ test in all dual slaughter plants in August 2011, and FSIS intends to phase in the KIS™ test as the only in-plant screening test for the Agency in CY2012.

Table 42 summarizes the total number of samples analyzed and the number of animals with violations for each production class. Column 1 lists the production classes and columns 2-6 show the number of samples and violations for COLLGEN, FAST, KIS, SHOW and STATE.

Tables 43–45 identifies the results for specific compounds that were detected (violative) within the production class across inspector-generated projects (i.e., collector-generated or COLLGEN, FAST, and KIS™) respectively. Column 1 lists the production class and the remaining columns list the specific chemical residues.

### 1. Samples Screened In-plant and Confirmed in an FSIS Laboratory

Fast Antimicrobial Screen Test (FAST)

FSIS IPP used FAST kits to screen 21,945 samples for antibiotic and sulfonamide residues. In-plant positive samples were sent to the labs to repeat the FAST. These FAST-positive samples were also analyzed for flunixin, a non-steroidal, anti-inflammatory compound. FSIS laboratories confirmed 52 violations in 36 animals. The residue violations included: 1 desfuroylceftiofur (DCA or DCCD), 1 flunixin, 1 gentamycin sulfate, 44 penicillin, 4 sulfamethazine, and 1 tulathromycin. FAST violation results are represented in Table 44.

Kidney Inhibition Swab (KIS™) Test

FSIS IPP used KIS™ test kits to screen 164,845 samples for antibiotic and sulfonamide residues. In-plant positive samples were sent to the labs to repeat the KIS™ test. These KIS™-positive samples were analyzed for flunixin, a non-steroidal, anti-inflammatory compound. FSIS laboratories confirmed 1,237 violations in 974 animals. The residue violations included 12 ampicillin, 1 ciproflaoxacin, 66 desfuroylceftiofur (DCA or DCCD), 9 dihydrostreptomycin, 142 flunixin, 66 gentamycinsulfate, 224 neomycin, 25 oxytetracycline, 33 paromomycin, 245 penicillin, 17 sulfadiazine, 129 sulfadimethoxine, 4 sulfadoxine, 115 sulfamethazine, 23

sulfamethoxazole, 2 sulfathiazole, 6 tetracycline, 71 tilmicosin, 46 tulathromycin, and 1 tylosin. KIS™ test violations results are represented in Table 45.

## 2. Samples Confirmed in an FSIS Laboratory

Collector-Generated (COLLGEN)

FSIS IPP analyzed samples collected from 232 animals for antibiotic and sulfonamide residues. FSIS laboratories confirmed 36 violations in 29 animals. The residues included 2 dihydrostreptomycin, 4 flunixin, 2 gentamycin sulfate, 1 neomycin, 14 oxytetracycline, 1 paromomycin, 2 penicillin, 4 sulfadimethoxine, 4 sulfamethazine, 1 tulathromycin, and 1 zilpaterol. Collector-generated (COLLGEN) violations results are represented in Table 38.

Show Animals (SHOW)

Analyses were conducted for antibiotic and sulfonamide residue in 95 animals, including 4 heifers, 8 lambs, 62 market hogs, and 20 steers. One violation was detected.

State or Government Agency Testing (STATE)

Analyses were conducted for antibiotic and sulfonamide residue in 19 animals. Seven violations in five animals were found. The residues included two gentamycin sulfate, one neomycin, one sulfadimethoxine, two sulfamethazine, and one tilmicosin.

Additional inspector-generated sampling results for non-violative positive residue samples are detailed in Tables 46–48. In Tables 46 and 47, column 1 lists the production classes (Table 46) or chemical class (Table 47) and columns 2-6 show the number of samples and violations for COLLGEN, FAST, KIS, SHOW and STATE. In Table 48, column 1 lists the chemical residue, and the remaining columns list the production classes.

Furthermore, Figure 32 consists of a series of pie charts that examine the distribution of residue violations by chemical residue and identified inspector-generated projects (i.e., COLLGEN, FAST, and KIS™ test) respectively.

**Table 42. Summary Results, 2011 Inspector-Generated Sampling (by Project Name)**
**Antibiotics, Sulfonamide and Non-steroidal Anti-inflammatory (NSAID) Compound [11]**

| Production Class | COLLGEN | | FAST | | KIS™ | | SHOW | | STATE | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Animals With Confirmed Lab Violations | Number of In-plant (screened) Samples | Number of Animals With Confirmed Lab Violations | Number of Samples | Number of Animals With Confirmed lab Violations | Number of Samples | Number of Animals With Confirmed Lab Violations | Number of Samples | Number of Animals With Confirmed Lab Violations |
| Beef Cows | 34 | 4 | 22 | 1 | 18,831 | 57 | -- | -- | -- | -- |
| Boars/Stags | -- | -- | 115 | -- | 5 | -- | -- | -- | -- | -- |
| Bob Veal | 20 | 2 | 56 | -- | 33,747 | 348 | -- | -- | 1 | 1 |
| Bulls | 8 | 1 | 11 | -- | 2,034 | 3 | -- | -- | -- | -- |
| Dairy Cows | 85 | 6 | 27 | -- | 95,248 | 468 | -- | -- | 2 | -- |
| Formula-Fed Veal | 4 | 2 | 16 | -- | 1,578 | 2 | -- | -- | -- | -- |
| Goats | 14 | 10 | 385 | -- | 114 | -- | -- | -- | -- | -- |
| Heavy Calves | 6 | 1 | 39 | -- | 276 | 2 | -- | -- | 2 | -- |
| Heifers | 7 | 1 | 35 | -- | 3,170 | 12 | 4 | -- | 4 | 1 |
| Lambs | 1 | -- | 1,225 | -- | 52 | -- | 8 | -- | -- | -- |
| Market Hogs | 16 | -- | 11,509 | 1 | 1339 | -- | 62 | -- | 4 | 1 |
| Mature Sheep | 2 | 1 | 349 | -- | 135 | -- | | -- | -- | -- |
| Non-Formula-Fed Veal | 2 | 1 | 1 | 1 | 541 | 63 | -- | -- | -- | -- |
| Roaster Pigs | 3 | -- | 1,144 | 1 | 84 | -- | -- | -- | -- | -- |
| Sows | 7 | -- | 6,938 | 32 | 113 | 1 | -- | -- | 6 | -- |
| Steers | 9 | -- | 73 | -- | 7,578 | 18 | 20 | 1 | -- | 2 |
| Other* | 14 | -- | -- | -- | -- | -- | 1 | -- | -- | -- |
| **Total** | **232** | **29** | **21,945** | **36** | **164,845** | **974** | **95** | **1** | **19** | **5** |

*Other represents samples submitted without identification of product class.

[11] Samples that are FAST and/or KIS™ test positive in the plant are further analyzed for flunixin and phenylbutazone in the laboratory.

**Table 43. Distribution of Residue Violations, Chemical Residue, and Animal Class - Project Name (COLLGEN)**
**2011 Inspector-Generated Sampling**

| Production Class | Ampicillin | Chlortetracycline | DCCD | Dihydro Streptomycin | Flunixin | Gentamycin Sulfate | Neomycin | Oxytetracycline | Paromomycin | Penicillin | Sulfadiazine | Sulfadimethoxine | Sulfadoxine | Sulfamethazine | Sulfamethoxazole | Sulfathiazole | Tetracycline | Tilmicosin | Tulathromycin | Tylosin | Zilpaterol | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Beef Cow | - | - | - | - | 1 | - | - | - | - | 1 | - | - | - | 1 | - | - | - | - | - | - | 1 | **4** |
| Bob Veal | - | - | - | - | - | - | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | **2** |
| Bull | - | - | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2** |
| Dairy Cow | - | - | 1 | - | 1 | - | - | - | - | 1 | - | 4 | - | - | - | - | - | - | - | - | - | **7** |
| Formula-Fed Veal | - | - | - | - | - | 1 | - | - | - | - | - | - | - | 2 | - | - | - | - | 1 | - | - | **4** |
| Goat | - | - | - | - | - | - | - | 12 | - | - | - | - | - | - | - | - | - | - | - | - | - | **12** |
| Heavy Calf | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Heifer | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Mature Sheep | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | **2** |
| Non Formula-Fed Veal | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | **1** |
| **TOTAL** | **-** | **-** | **2** | **-** | **4** | **2** | **1** | **14** | **1** | **2** | **-** | **4** | **-** | **4** | **-** | **-** | **-** | **-** | **1** | **-** | **1** | **36** |

**Table 44. Distribution of Residue Violations, Chemical Residue, and Animal Class -Project Name (FAST)**
**2011 Inspector-Generated Sampling**

| Production Class | Ampicillin | Chlortetracycline | DCCD | Dihydro Streptomycin | Flunixin | Gentamycin Sulfate | Neomycin | Oxytetracycline | Paromomycin | Penicillin | Sulfadiazine | Sulfadimethoxine | Sulfadoxine | Sulfamethazine | Sulfamethoxazole | Sulfathiazole | Tetracycline | Tilmicosin | Tulathromycin | Tylosin | Zilpaterol | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Beef Cow | - | - | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2** |
| Market Swine | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Non Formula-Fed Veal | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 | - | - | - | - | 1 | - | - | **5** |
| Roaster Swine | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Sow | - | - | - | - | - | - | - | - | - | 43 | - | - | - | - | - | - | - | - | - | - | - | **43** |
| **TOTAL** | **-** | **-** | **1** | **-** | **1** | **1** | **-** | **-** | **-** | **44** | **-** | **-** | **-** | **4** | **-** | **-** | **-** | **-** | **1** | **-** | **-** | **52** |

**Table 45. Distribution of Residue Violations, Chemical Residue, and Animal Class - Project Name (KIS™ Test)**

**2011 Inspector-Generated Sampling**

| Production Class | Ampicillin | Chlortetracycline | DCCD | Dihydro Streptomycin | Flunixin | Gentamycin Sulfate | Neomycin | Oxytetracycline | Paromomycin | Penicillin | Sulfadiazine | Sulfadimethoxine | Sulfadoxine | Sulfamethazine | Sulfamethoxazole | Sulfathiazole | Tetracycline | Tilmicosin | Tulathromycin | Tylosin | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Beef Cow | 1 | - | 4 | 1 | 12 | 5 | 3 | 2 | - | 15 | - | 2 | - | 14 | - | - | - | 7 | - | - | **66** |
| Bob Veal | - | 1 | 8 | 1 | 30 | 22 | 191 | 11 | 27 | 24 | 3 | 17 | - | 51 | 23 | 2 | 1 | 20 | 21 | - | **453** |
| Bull | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | 1 | 2 | - | - | **4** |
| Dairy Cow | 11 | - | 53 | 7 | 89 | 35 | 14 | 12 | 1 | 195 | - | 90 | 4 | 28 | - | - | 4 | 24 | - | 1 | **568** |
| Formula-Fed Veal | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | **2** |
| Heavy Calf | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | **2** |
| Heifer | - | - | - | - | 1 | 3 | 1 | - | - | 3 | - | 5 | - | 5 | - | - | - | 1 | - | - | **19** |
| Non-Formula-Fed Veal | - | - | - | - | 2 | 1 | 15 | - | 4 | - | 14 | 14 | - | 8 | - | - | - | 15 | 24 | - | **97** |
| Sow | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | **2** |
| Steer | - | - | 1 | - | 8 | - | - | - | 1 | 4 | - | - | - | 9 | - | - | - | 1 | - | - | **24** |
| **TOTAL** | **12** | **1** | **66** | **9** | **142** | **66** | **224** | **25** | **33** | **245** | **17** | **129** | **4** | **115** | **23** | **2** | **6** | **71** | **46** | **1** | **1,237** |

**Table 46. Distribution of Non-Violative Positive Residue by Production Class and Project Name**
***might include multiple non-violations residue samples per one animal**
**2011 Inspector-Generated Sampling Results**

| Production Class | Project ID | | | | | |
|---|---|---|---|---|---|---|
| | FAST | KIS™ Test | COLLGEN | SHOW | STATE | Total |
| Beef Cow | - | 149 | 4 | - | - | **153** |
| Boar/Stag Swine | 2 | - | - | - | - | **2** |
| Bob Veal | - | 456 | 2 | - | - | **458** |
| Bull | 1 | 21 | - | - | - | **22** |
| Dairy Cow | - | 726 | 14 | - | 1 | **741** |
| Formula-Fed Veal | - | 10 | 3 | - | - | **13** |
| Goat | 3 | - | 1 | - | - | **4** |
| Heavy Calf | - | 13 | 4 | - | 3 | **20** |
| Heifer | - | 26 | 6 | - | 4 | **36** |
| Lamb | 4 | - | - | - | - | **4** |
| Market Swine | 136 | 1 | 8 | 6 | 1 | **152** |
| Mature Sheep | 1 | - | - | - | - | **1** |
| Non-Formula-Fed Veal | 3 | 125 | 3 | - | - | **131** |
| Roaster Swine | 13 | - | - | - | - | **13** |
| Sow | 50 | - | - | - | - | **50** |
| Steer | - | 70 | 1 | 2 | 7 | **80** |
| Young Turkey | - | - | 2 | 1 | - | **3** |
| **TOTAL** | **213** | **1,597** | **48** | **9** | **16** | **1,883** |

**Table 47. Distribution of Non-Violative Positive Residue by Residue-Compound Class and Project Name**
**2011 Inspector-Generated Sampling Results**

| Chemical Residue | Project ID | | | | | |
|---|---|---|---|---|---|---|
| | FAST | KIS ™ Test | COLLGEN | SHOW | STATE | Total |
| Amoxicillin | - | 1 | - | - | - | **1** |
| Ampicillin | - | 27 | 2 | - | - | **29** |
| Cefazolin | - | 1 | - | - | - | **1** |
| Chlortetracycline | 5 | 40 | 2 | - | 4 | **51** |
| Desacetyl Cephaprin | - | 7 | - | - | - | **7** |
| Desethylene ciprofloxacin | - | 1 | - | - | - | **1** |
| Desfuroylceftiofur Cysteine Disulfide | 1 | 57 | 2 | - | - | **60** |
| Dihydro Streptomycin | - | 51 | - | - | - | **51** |
| Dihydrostreptomycin | - | 2 | - | - | - | **2** |
| Enrofloxacin | - | 1 | - | - | - | **1** |
| Flunixin | - | 88 | 2 | - | - | **90** |
| Gentamycin Sulfate | 1 | - | - | - | - | **1** |
| Lincomycin | - | 4 | 1 | - | - | **5** |
| Neomycin | 24 | 389 | 8 | - | - | **421** |
| Oxytetracycline | 7 | 189 | 6 | - | 4 | **206** |
| Penicillin | 1 | 159 | 4 | 1 | - | **165** |
| Pirlimycin | - | 8 | - | - | - | **8** |
| Ractopamine | - | - | - | 3 | - | **3** |
| Spectinomycin | - | 14 | - | - | - | **14** |
| Sulfadimethoxine | - | 6 | - | - | 1 | **7** |
| Sulfamethazine | - | 7 | - | - | - | **7** |
| Tetracycline | - | 76 | 2 | 1 | - | **79** |
| Tetracycline Positive | 66 | 188 | 9 | - | 3 | **266** |
| Tilmicosin | - | 31 | 1 | - | - | **32** |

**Table 47. Distribution of Non-Violative Positive Residue by Residue Compound Class and Project Name *(Continue)***
**2011 Inspector-Generated Sampling Results**

| Chemical Residue | Project ID | | | | | |
|---|---|---|---|---|---|---|
| | FAST | KIS ™ Test | COLLGEN | SHOW | STATE | Total |
| Tulathromycin | 2 | 200 | 5 | 1 | 4 | **212** |
| Tylosin | - | 7 | - | - | - | **7** |
| UMI | 106 | 42 | 4 | 3 | - | **155** |
| Unidentified Analytical Response - Other | - | 1 | - | - | - | **1** |
| **TOTAL** | **213** | **1,597** | **48** | **9** | **16** | **1,883** |

**Table 48. Distribution of Non-Violative Positive Residue by Residue Compound Class and Production Class**
**2011 Inspector-Generated Sampling Results**

| Chemical Residue | Beef Cow | Boar/Stag Swine | Bob Veal | Bull | Dairy Cow | Formula-fed Veal | Goat | Heavy Calf | Heifer | Lamb | Market Swine | Mature Sheep | Non Formula-fed Veal | Roaster Swine | Sow | Steer | Young Turkey | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Amoxicillin | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Ampicillin | - | - | 1 | - | 27 | - | - | - | 1 | - | - | - | - | - | - | - | - | **29** |
| Cefazolin | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Chlortetracycline | 2 | - | 9 | - | 4 | - | - | 4 | 3 | - | 3 | - | 22 | 2 | - | 2 | - | **51** |
| Desacetyl Cephaprin | 1 | - | - | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | **7** |
| Desethylene ciprofloxacin | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Desfuroylceftiofur Cystine Disulfide | - | - | 6 | - | 51 | - | - | - | 1 | - | - | - | 1 | - | - | 1 | - | **60** |
| Dihydro Streptomycin | 2 | - | 38 | - | 11 | - | - | - | - | - | - | - | - | - | - | - | - | **51** |
| Dihydrostreptomycin | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2** |

| Chemical Residue | Beef Cow | Boar/Stag Swine | Bob Veal | Bull | Dairy Cow | Formula-fed Veal | Goat | Heavy Calf | Heifer | Lamb | Market Swine | Mature Sheep | Non Formula-fed Veal | Roaster Swine | Sow | Steer | Young Turkey | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enrofloxacin | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| Flunixin | 7 | - | - | 1 | 75 | - | - | - | 7 | - | - | - | - | - | - | - | - | **90** |
| Gentamycin Sulfate | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | **1** |
| Lincomycin | - | - | 1 | - | 3 | - | - | - | - | - | 1 | - | - | - | - | - | - | **5** |
| Neomycin | 22 | - | 212 | 2 | 69 | 5 | - | 7 | 3 | - | 17 | - | 70 | 2 | 5 | 7 | - | **421** |
| Oxytetracycline | 22 | - | 108 | 4 | 54 | - | - | 1 | 2 | 3 | - | 1 | 2 | - | 3 | 6 | - | **206** |
| Penicillin | 9 | - | 4 | 3 | 145 | - | - | - | 1 | - | - | - | - | - | 1 | 2 | - | **165** |
| Pirlimycin | - | - | 1 | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - | **8** |
| Ractopamine | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | 1 | **3** |
| Spectinomycin | - | - | 1 | - | 10 | 1 | - | - | - | - | - | - | - | - | - | 2 | - | **14** |
| Sulfadimethoxine | - | - | - | - | 5 | - | - | - | - | - | - | - | 1 | - | - | 1 | - | **7** |
| Sulfamethazine | - | - | 1 | - | 3 | - | - | - | - | - | - | - | 3 | - | - | - | - | **7** |
| Tetracycline | 3 | - | 16 | - | 55 | - | - | - | - | - | 2 | - | 3 | - | - | - | - | **79** |
| Tetracycline Positve | 25 | - | 47 | 2 | 86 | 6 | 1 | 1 | 6 | - | 49 | - | 14 | 7 | 10 | 10 | 2 | **266** |
| Tilmicosin | 3 | - | - | 3 | 16 | - | - | - | 1 | - | 1 | - | 4 | - | - | 4 | - | **32** |
| Tulathromycin | 52 | - | - | 6 | 92 | - | - | 7 | 10 | - | 3 | - | - | - | - | 42 | - | **212** |
| Tylosin | - | - | 2 | - | 3 | - | - | - | - | - | - | - | 2 | - | - | - | - | **7** |
| UMI | 4 | 2 | 6 | 1 | 18 | 1 | 3 | - | 1 | 1 | 73 | - | 9 | 2 | 31 | 3 | - | **155** |
| Unidentified Analytical Response - Other | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1** |
| **TOTAL** | **153** | **2** | **458** | **22** | **741** | **13** | **4** | **20** | **36** | **4** | **152** | **1** | **131** | **13** | **50** | **80** | **3** | **1,883** |

## INSPECTOR-GENERATED SAMPLING

### Suspect Populations

FSIS tested suspect populations in bob veal for antibiotics, sulfonamides, and *beta*-agonists.

FAST Results for Bob Veal

FSIS IPP used the FAST test to screen 56 samples from bob veal calves for antibiotics and sulfonamides. Of the animals tested, FSIS laboratories confirmed no violations.

KIS™ Test Results for Bob Veal

FSIS IPP used KIS™ tests to screen 33,747 samples from bob veal calves for antibiotics and sulfonamides. Of the animals tested, FSIS laboratories confirmed 453 violations in 348 animals. The residue violations consisted of 1 chlortetracycline, 8 DCCD, 1 dihydrostreptomycin, 30 flunixin, 22 gentamycin sulfate, 191 neomycin, 11 oxytetracycline, 27 paromomycin, 24 penicillin, 3 sulfadiazine, 17 sulfadimethoxine, 51 sulfamethazine, 23 sulfamethoxazole, 2 sulfathiazole, 1 tetracycline, 20 tilmicosin, and 21 tulathromycin.

### Show Animals

FSIS laboratories conducted analyses for antibiotics and sulfonamides on two lambs, one market hog, and eight steers; only one violation was detected in steer.

**Import Reinspection Results**
**Normal Reinspection**

Table 49 presents results for imported products subject to normal reinspection. Column 1 lists the country; column 2, the species; column 3, the type of product. The data on the right-hand side of the table include the number of analyses, non-detects, non-violative positives, and violations found for each compound class.

**Table 49. Normal Reinspection Results - 2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Argentina | Beef | Processed | Avermectin | 69 | 65 | - | 4 |
| | | | Pesticides/Herbicides | 3 | 3 | - | - |
| | | | Sulfonamides | 6 | 6 | - | - |
| Total by Country | | | | 78 | 74 | - | 4 |
| Australia | Beef | Fresh | Antibiotics | 52 | 52 | - | - |
| | | | Avermectin | 64 | 64 | - | - |
| | | | Chloramphenicol | 6 | 6 | - | - |
| | | | Florfenicol | 6 | 6 | - | - |
| | | | Flunixin | 11 | 11 | - | - |
| | | | Pesticides/Herbicides | 60 | 60 | - | - |
| | | | Sulfonamides | 63 | 63 | - | - |
| | Goat | Fresh | Avermectin | 17 | 17 | - | - |
| | | | Pesticides/Herbicides | 8 | 8 | - | - |
| | Veal | Fresh | Antibiotics | 5 | 5 | - | - |
| | | | Avermectin | 8 | 7 | - | 1 |
| | | | *beta*-Agonist | 5 | 5 | - | - |
| | | | Chloramphenicol | 5 | 5 | - | - |
| | | | Sulfonamides | 7 | 7 | - | - |
| | | | Thyreostats | 1 | 1 | - | - |
| | | | Zeranol | 1 | 1 | - | - |
| Total by Country | | | | 319 | 318 | - | 1 |
| Brazil | Beef | Processed | Avermectin | 39 | 39 | - | - |
| | | | Pesticides/Herbicides | 4 | 4 | - | - |
| | | | Sulfonamides | 17 | 17 | - | - |
| Total by Country | | | | 60 | 60 | - | - |

**Table 49. Normal Reinspection Results *(continued)***
**2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Canada | Beef | Fresh | Antibiotics | 14 | 14 | - | - |
| | | | Avermectin | 71 | 71 | - | - |
| | | | Chloramphenicol | 12 | 12 | - | - |
| | | | Florfenicol | 24 | 24 | - | - |
| | | | Flunixin | 21 | 21 | - | - |
| | | | Pesticides/Herbicides | 66 | 66 | - | - |
| | | | Sulfonamides | 73 | 73 | - | - |
| | Chicken | Fresh | Antibiotics | 71 | 71 | - | - |
| | | | Arsenic | 61 | 61 | - | - |
| | | | Chloramphenicol | 61 | 61 | - | - |
| | | | Nitroimidazoles | 43 | 43 | - | - |
| | Equine | Fresh | Antibiotics | 4 | 4 | - | - |
| | | | Pesticides/Herbicides | 1 | 1 | - | - |
| | | | Sulfonamides | 2 | 2 | - | - |
| | Pork | Fresh | Antibiotics | 121 | 121 | - | - |
| | | | Arsenic | 3 | 3 | - | - |
| | | | *beta*-Agonist | 1 | 1 | - | - |
| | | | Sulfonamides | 121 | 121 | - | - |
| | Turkey | Fresh | Antibiotics | 7 | 7 | - | - |
| | | | Arsenic | 7 | 7 | - | - |
| | | | Chloramphenicol | 7 | 7 | - | - |
| | | | Pesticides/Herbicides | 7 | 7 | - | - |
| | | | Sulfonamides | 7 | 7 | - | - |
| | Veal | Fresh | Antibiotics | 57 | 57 | - | - |
| | | | Avermectin | 41 | 41 | - | - |
| | | | *beta*-Agonist | 34 | 34 | - | - |
| | | | Chloramphenicol | 39 | 39 | - | - |
| | | | Sulfonamides | 41 | 41 | - | - |
| | | | Thyreostats | 4 | 4 | - | - |
| | | | Zeranol | 3 | 3 | - | - |
| Total by Country | | | | 1,024 | 1,024 | - | - |

**Table 49. Normal Reinspection Results *(continued)***
**2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Chile | Beef | Fresh | Antibiotics | 5 | 5 | - | - |
| | | | Avermectin | 5 | 5 | - | - |
| | | | Chloramphenicol | 5 | 5 | - | - |
| | | | Florfenicol | 5 | 5 | - | - |
| | | | Flunixin | 5 | 5 | - | - |
| | | | Pesticides/Herbicides | 6 | 6 | - | - |
| | | | Sulfonamides | 5 | 5 | - | - |
| | Chicken | Fresh | Antibiotics | 9 | 9 | - | - |
| | | | Arsenic | 12 | 12 | - | - |
| | | | Chloramphenicol | 12 | 12 | - | - |
| | | | Nitroimidazoles | 8 | 8 | - | - |
| | Pork | Fresh | Antibiotics | 6 | 6 | - | - |
| | | | Arsenic | 3 | 3 | - | - |
| | | | *beta*-Agonist | 4 | 4 | - | - |
| | | | Sulfonamides | 3 | 3 | - | - |
| | Turkey | Fresh | Antibiotics | 9 | 9 | - | - |
| | | | Arsenic | 9 | 9 | - | - |
| | | | Chloramphenicol | 9 | 9 | - | - |
| | | | Pesticides/Herbicides | 7 | 7 | - | - |
| | | | Sulfonamides | 9 | 9 | - | - |
| Total by Country | | | | 136 | 136 | - | - |
| Costa Rica | Beef | Fresh | Antibiotics | 4 | 4 | - | - |
| | | | Avermectin | 119 | 119 | - | - |
| | | | Chloramphenicol | 7 | 7 | - | - |
| | | | Florfenicol | 5 | 5 | - | - |
| | | | Flunixin | 7 | 7 | - | - |
| | | | Pesticides/Herbicides | 5 | 5 | - | - |
| | | | Sulfonamides | 6 | 6 | - | - |
| Total by Country | | | | 153 | 153 | - | - |

**Table 49. Normal Reinspection Results *(continued)***
**2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Croatia | Pork | Processed | Sulfonamides | 7 | 7 | - | - |
| Total by Country | | | | 7 | 7 | - | - |
| Denmark | Pork | Fresh | Antibiotics | 15 | 15 | - | - |
| | | | Arsenic | 5 | 5 | - | - |
| | | | Pesticides/Herbicides | 3 | 3 | - | - |
| | | | Sulfonamides | 14 | 14 | - | - |
| Total by Country | | | | 37 | 37 | - | - |
| Finland | Pork | Fresh | Antibiotics | 4 | 4 | - | - |
| | | | Arsenic | 5 | 5 | - | - |
| | | | Sulfonamides | 6 | 6 | - | - |
| Total by Country | | | | 15 | 15 | - | - |
| Germany | Pork | Processed | Sulfonamides | 10 | 10 | - | - |
| Total by country | | | | 10 | 10 | - | - |
| Honduras | Beef | Fresh | Antibiotics | 11 | 11 | - | - |
| | | | Avermectin | 25 | 23 | - | 2 |
| | | | Chloramphenicol | 16 | 16 | - | - |
| | | | Florfenicol | 5 | 5 | - | - |
| | | | Flunixin | 11 | 11 | - | - |
| | | | Pesticides/Herbicides | 3 | 3 | - | - |
| | | | Sulfonamides | 16 | 16 | - | - |
| Total by Country | | | | 87 | 85 | - | 2 |
| Hungary | Pork | Processed | Sulfonamides | 8 | 8 | - | - |
| Total by Country | | | | 8 | 8 | - | - |
| Ireland | Pork | Fresh | Antibiotics | 3 | 3 | - | - |
| | | | Arsenic | 4 | 4 | - | - |
| | | | Sulfonamides | 4 | 4 | - | - |
| Total by Country | | | | 11 | 11 | - | - |

**Table 49. Normal Reinspection Results *(continued)***
**2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Israel | Chicken | Processed | Arsenic | 8 | 8 | - | - |
| | Turkey | Processed | Arsenic | 8 | 8 | - | - |
| | | | Pesticides/Herbicides | 2 | 2 | - | - |
| | | | Sulfonamides | 8 | 8 | - | - |
| Total by Country | | | | 26 | 26 | - | - |
| Italy | Pork | Processed | Sulfonamides | 12 | 12 | - | - |
| Total by Country | | | | 12 | 12 | - | - |
| Mexico | Beef | Fresh | Antibiotics | 8 | 8 | - | - |
| | | | Avermectin | 7 | 7 | - | - |
| | | | *beta*-Agonist | 18 | 18 | - | - |
| | | | Chloramphenicol | 7 | 7 | - | - |
| | | | Florfenicol | 4 | 4 | - | - |
| | | | Flunixin | 8 | 8 | - | - |
| | | | Pesticides/Herbicides | 8 | 8 | - | - |
| | | | Sulfonamides | 7 | 7 | - | - |
| | Chicken | Fresh | Antibiotics | 2 | 2 | - | - |
| | | | Arsenic | 1 | 1 | - | - |
| | | | Chloramphenicol | 1 | 1 | - | - |
| | Goat | Fresh | Avermectin | 5 | 5 | - | - |
| | | | Pesticides/Herbicides | 2 | 2 | - | - |
| | Pork | Fresh | Antibiotics | 8 | 8 | - | - |
| | | | Arsenic | 6 | 6 | - | - |
| | | | *beta*-Agonist | 8 | 8 | - | - |
| | | | Sulfonamides | 12 | 12 | - | - |
| | Turkey | Processed | Arsenic | 5 | 5 | - | - |
| | | | Pesticides/Herbicides | 2 | 2 | - | - |
| | | | Sulfonamides | 5 | 5 | - | - |
| Total by Country | | | | 124 | 124 | - | - |

**Table 49. Normal Reinspection Results *(continued)***
**2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Netherlands | Pork | Fresh | Antibiotics | 7 | 7 | - | - |
| | | | Arsenic | 8 | 8 | - | - |
| | | | *beta*-Agonist | 3 | 3 | - | - |
| | | | Sulfonamides | 8 | 8 | - | - |
| Total by Country | | | | 26 | 26 | - | - |
| New Zealand | Beef | Fresh | Antibiotics | 49 | 49 | - | - |
| | | | Avermectin | 50 | 50 | - | - |
| | | | Chloramphenicol | 2 | 2 | - | - |
| | | | Florfenicol | 2 | 2 | - | - |
| | | | Flunixin | 3 | 3 | - | - |
| | | | Pesticides/Herbicides | 84 | 84 | - | - |
| | | | Sulfonamides | 49 | 49 | - | - |
| | Goat | Fresh | Avermectin | 6 | 6 | - | - |
| | | | Pesticides/Herbicides | 4 | 4 | - | - |
| | Combination | Fresh | Avermectin | 1 | 1 | | |
| | Veal | Fresh | Antibiotics | 36 | 36 | - | - |
| | | | Avermectin | 26 | 26 | - | - |
| | | | *beta*-Agonist | 36 | 36 | - | - |
| | | | Chloramphenicol | 25 | 25 | - | - |
| | | | Sulfonamides | 26 | 26 | - | - |
| | | | Thyreostats | 5 | 5 | - | - |
| | | | Zeranol | 4 | 4 | - | - |
| Total by Country | | | | 408 | 408 | - | - |
| Nicaragua | Beef | Fresh | Antibiotics | 8 | 8 | - | - |
| | | | Avermectin | 9 | 9 | - | - |
| | | | Chloramphenicol | 5 | 5 | - | - |
| | | | Florfenicol | 5 | 5 | - | - |
| | | | Flunixin | 5 | 5 | - | - |
| | | | Pesticides/Herbicides | 10 | 10 | - | - |
| | | | Sulfonamides | 5 | 5 | - | - |
| Total by Country | | | | 47 | 47 | - | - |

**Table 49. Normal Reinspection Results *(continued)***
**2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Northern Ireland | Pork | Fresh | Antibiotics | 8 | 8 | - | - |
| | | | Arsenic | 8 | 8 | - | - |
| | | | *beta*-Agonist | 5 | 5 | - | - |
| | | | Sulfonamides | 8 | 8 | - | - |
| Total by Country | | | | 29 | 29 | - | - |
| Poland | Pork | Fresh | Antibiotics | 9 | 9 | - | - |
| | | | Arsenic | 8 | 8 | - | - |
| | | | *beta*-Agonist | 3 | 3 | - | - |
| | | | Sulfonamides | 8 | 8 | - | - |
| Total by Country | | | | 28 | 28 | - | - |
| San Marino | Pork | Processed | Sulfonamides | 2 | 2 | - | - |
| Total by Country | | | | 2 | 2 | - | - |
| Spain | Pork | Fresh | Antibiotics | 7 | 7 | - | - |
| | | | Arsenic | 7 | 7 | - | - |
| | | | *beta*-Agonist | 8 | 8 | - | - |
| | | | Sulfonamides | 7 | 7 | - | - |
| Total by Country | | | | 29 | 29 | - | - |
| Sweden | Pork | Fresh | Antibiotics | 2 | 2 | - | - |
| | | | Arsenic | 2 | 2 | - | - |
| | | | *beta*-Agonist | 1 | 1 | - | - |
| | | | Sulfonamides | 2 | 2 | - | - |
| Total by Country | | | | 7 | 7 | - | - |
| United Kingdom | Pork | Fresh | Antibiotics | 6 | 6 | - | - |
| | | | Arsenic | 6 | 6 | - | - |
| | | | *beta*-Agonist | 3 | 3 | - | - |
| | | | Sulfonamides | 6 | 6 | - | - |
| Total by Country | | | | 21 | 21 | - | - |

**Table 49. Normal Reinspection Results *(continued)***
**2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Uruguay | Beef | Fresh | Antibiotics | 6 | 6 | - | - |
| | | | Avermectin | 6 | 6 | - | - |
| | | | Chloramphenicol | 5 | 5 | - | - |
| | | | Florfenicol | 5 | 5 | - | - |
| | | | Flunixin | 8 | 8 | - | - |
| | | | Pesticides/Herbicides | 6 | 6 | - | - |
| | | | Sulfonamides | 6 | 6 | - | - |
| Total by Country | | | | 42 | 42 | - | - |
| **TOTAL IMPORT (Normal)** | | | | **2,746** | **2,739** | **-** | **7** |

**Increased Reinspection Results**
No samples were selected.

**Intensified Reinspection Results**

Table 50 presents results for import products subject to intensified reinspection. Column 1 lists the country, column 2 the species, column 3 the type of product. The data on the right-hand side of the table include the number of analyses, non-detects, non-violative positives, and violations found for each compound class tested by product class.

**Table 50. Intensified Reinspection Results**
**2011 Import Residue Plan**

| Country | Species | Type | Compound Class | Number of Analyses | Number of Non-Detects | Number of Non-Violative Positives | Number of Violations |
|---|---|---|---|---|---|---|---|
| Argentina | Beef | Processed | Avermectin | 48 | 40 | - | 8 |
| Total by Country | | | | 48 | 40 | - | 8 |
| Australia | Beef | Fresh | Avermectin | 37 | 37 | - | - |
| | Veal | Fresh | Avermectin | 2 | 2 | - | - |
| Total by Country | | | | 39 | 39 | - | - |
| Brazil | Beef | Processed | Avermectin | 7 | 6 | - | 1 |
| Total by Country | | | | 7 | 6 | - | 1 |
| Honduras | Beef | Fresh | Avermectin | 41 | 41 | - | - |
| Total by Country | | | | 41 | 41 | - | - |
| **TOTAL IMPORT (Intensified)** | | | | **135** | **126** | **-** | **9** |

# Appendix I
# FSIS Laboratory Analytical Methods

FSIS uses analytical methods to detect, identify, and quantify residues that may be present in meat, poultry, and processed egg products. The Agency uses these methods for monitoring and surveillance activities to determine product adulteration and for human risk assessment evaluations. The Agency uses available methodologies to take appropriate regulatory action against adulterated products in a manner consistent with the reliability of the analytical data. The table below lists the analytical methods and provides links to each method. View the FSIS Analytical Chemistry Laboratory Guidebook here.

| Compound | Method | Species | Tissue |
|---|---|---|---|
| Aminoglycosides | CLG-AMG2.05 | bovine, porcine | kidney, liver, muscle |
| | CLG-AMG1.03 | bovine, porcine, poultry | kidney, liver, muscle |
| Antibiotics | MLG-34.03 | meat and poultry | kidney, liver, muscle |
| Avermectins | CLG-AVR.04 | bovine, porcine, ovine, caprine, equine | liver, muscle |
| | CLG-AVR1.03 | bovine, porcine, ovine, caprine, equine | liver, muscle |
| Beta-Agonists | CLG-AGON1.04 | bovine, porcine, ovine, caprine | liver |
| | | bovine, porcine | muscle |
| | CLG-RAC1.01 | bovine, porcine | liver, muscle |
| Beta-lactams | CLG-BLAC.03 | bovine, porcine | kidney, muscle |
| Carbadox | CLG-CBX1.02 | pork | liver |
| | CLG-CBX2.00 | pork | liver |
| Chloramphenicol | CLG-CAM1.02 | beef, poultry, swine | muscle |
| | CLG-CAM.05 | beef, poultry | muscle |
| Florfenicol | CLG-FLOR1.04 | bovine, poultry | liver, muscle |
| | CLG-FLOR2.02 | bovine, poultry | liver, muscle |
| Flunixin | CLG-FLX4.03 | bovine, (porcine extension in progress) | liver, muscle |
| Fluoroquinolones | CLG-FLQ2.00 | bovine | liver, muscle |
| Macrolides | CLG-MAL1.02 | beef, pork, poultry | kidney, liver, muscle |
| Metals | CLG-TM3.03 | beef, pork, poultry | kidney, liver, muscle |
| | CLG-TM4.01 | meat and food products | kidney, liver, muscle |
| | CLG-ARS.04 | all animal species, egg products | kidney, liver, muscle |
| MRM (multi-residue method) | CLG-MRM 1.02 | beef, pork | kidney |
| Nitrofurans | CLG-NFUR2.01 | bovine, porcine, poultry | liver |
| Pesticides* | CLG-PST5.02 | chicken, pork, beef | muscle |
| Phenylbutazone | CLG-PBZ2.03 | beef | kidney |
| Sulfonamides | CLG-SUL4.02 | porcine, bovine, avian | liver, muscle |
| | CLG-SUL2.06 | porcine, bovine, avian | liver, muscle |
| Tetracyclines | CLG-TET2.04 | bovine, porcine, ovine | kidney, liver, muscle |
| | | poultry | kidney, muscle |
| Tilmicosin | CLG-TIL1.02 | bovine | kidney, liver, muscle |
| Zeranol | CLG-ANA.02 | ovine, bovine | liver, muscle |

# APPENDIX II
# Statistical Table

Table AII indicates the number of samples required to ensure detection of a violation that affects a given percentage of the sampled population. Statistically, for a binomial distribution with sample size "*n*" and violation rate "*v*" (in decimal number), if *v* is the true violation rate in the population and *n* is the number of samples, the probability, *p*, of finding at least one violation among the *n* samples (assuming random sampling) is $p = 1-(1-v)^n$. Therefore, if the true violation rate is 1% (i.e., -.01), the probabilities of detecting at least one violation with sampling levels of 230 and 300 are 0.90 and 0.95, respectively.

**Table AII. Statistical Table**
**2011 National Residue Program**

| Percentage % Violative in the Sample ($v$) | Probability ($p$) of detecting at least one violation in ($n$) samples | | | |
|---|---|---|---|---|
| | **0.90** | **0.95** | **0.99** | **0.999** |
| | Sample size required "$n$" | | | |
| **10** | 22 | 29 | 44 | 66 |
| **5** | 45 | 59 | 90 | 135 |
| **1** | 230 | 300 | 459 | 688 |
| **0.5** | 460 | 598 | 919 | 1,379 |
| **0.1** | 2,302 | 2,995 | 4,603 | 6,905 |
| **0.05** | 4,605 | 5,990 | 9,209 | 13,813 |

Procedure to calculate the required sample size:

$1 - p = (1 - v)^n$ ← Subtract one from both side of the equation

$\log(1 - p) = \log(1 - v)^n$ ← Apply logarithmic function to both side of the equation

$\log(1 - p) = n * \log(1 - v)$ ← A logarithmic function property

$n = \frac{\log(1 - p)}{\log(1 - v)}$ ← Sample size based on violation rate ($v$) and probability of detecting ($p$)

# APPENDIX III
# Summary of NRP
# Scheduled Sampling Data
# From 2008 to 2010

**Antibiotics (7-plate bioassay)**

| Production Class | CY 2010 | | | CY 2009 | | | CY 2008 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Specific Antibiotic Violations | Number of Analyses | Number of Violations | Specific Antibiotic Violations | Number of Analyses | Number of Violations | Specific Antibiotic Violations |
| Beef cows | 309 | 0 | ----- | 277 | 0 | ----- | 0 | 0 | ----- |
| Boars/Stags | 291 | 0 | ----- | 260 | 0 | ----- | 296 | 0 | ----- |
| Bob veal | 208 | 3 | 3 neomycin | 259 | 1 | 1 neomycin | 253 | 1 | 1 gentamycin |
| Bulls | 292 | 0 | ----- | 257 | 0 | ----- | 292 | 0 | ----- |
| Dairy cows | 306 | 1 | 1 neomycin | 295 | 0 | ----- | 246 | 0 | ----- |
| Ducks | 57 | 0 | ----- | 51 | 0 | ----- | 57 | 0 | ----- |
| Formula-fed | 268 | 0 | ----- | 338 | 0 | ----- | 302 | 0 | ----- |
| Geese | 29 | 0 | ----- | 20 | 0 | ----- | 0 | 0 | ----- |
| Goats | 77 | 0 | ----- | 63 | 0 | ----- | 85 | 1 | 1 oxytetra cycline |
| Heavy calves | 81 | 0 | ----- | 68 | 0 | ----- | 100 | 0 | ----- |
| Heifers | 276 | 0 | ----- | 256 | 0 | ----- | 300 | 0 | ----- |
| Horses | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Lambs | 248 | 0 | ----- | 256 | 0 | ----- | 251 | 0 | ----- |
| Market hogs | 278 | 0 | ----- | 296 | 0 | ----- | 323 | 0 | ----- |
| Mature chickens | 319 | 0 | ----- | 336 | 0 | ----- | 0 | 0 | ----- |

**Antibiotics (7-plate bioassay) (Continued)**

| Production Class | CY 2010 | | | CY 2009 | | | CY 2008 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Specific Antibiotic Violations | Number of Analyses | Number of Violations | Specific Antibiotic Violations | Number of Analyses | Number of Violations | Specific Antibiotic Violations |
| Mature sheep | 230 | 0 | ----- | 207 | 0 | ----- | 62 | 0 | ----- |
| Mature turkeys | 239 | 0 | ----- | 264 | 0 | ----- | 0 | 0 | ----- |
| Non-formula-fed veal | 63 | 0 | ----- | 106 | 2 | 1 gentamycin, 1 tilmicosin | 102 | 0 | ----- |
| Rabbits | 47 | 0 | ----- | 52 | 0 | ----- | 57 | 0 | ----- |
| Roaster pigs | 292 | 1 | 1 gentamycin sulfate | 297 | 0 | ----- | 289 | 0 | ----- |
| Sows | 300 | 0 | ----- | 257 | 0 | ----- | 223 | 0 | ----- |
| Steers | 263 | 0 | ----- | 293 | 2 | 2 gentamycin | 318 | 0 | ----- |
| Young chickens | 298 | 0 | ----- | 321 | 0 | ----- | 296 | 0 | ----- |
| Young turkeys | 0 | 0 | ----- | 325 | 0 | ----- | 294 | 0 | ----- |

**Arsenic**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Beef cows | 299 | 0 | 279 | 0 | 604 | 1 |
| Dairy cows | 0 | 0 | 277 | 0 | 0 | 0 |
| Egg products | 0 | 0 | 0 | 0 | 0 | 0 |
| Market hogs | 0 | 0 | 281 | 0 | 0 | 0 |
| Mature chickens | 0 | 0 | 312 | 0 | 0 | 0 |
| Mature turkeys | 258 | 0 | 0 | 0 | 328 | 0 |
| Young chickens | 0 | 0 | 324 | 0 | 0 | 0 |
| Young turkeys | 308 | 0 | 0 | 0 | 0 | 0 |

**Avermectins**

| Production Class | CY 2010 | | | CY 2009 | | | CY 2008 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Specific Avermectin Violations | Number of Analyses | Number of Violations | Specific Avermectin Violations | Number of Analyses | Number of Violations | Specific Avermectin Violations |
| Beef cows | 302 | 1 | 1 doramectin | 228 | 0 | ----- | 0 | 0 | ------ |
| Boars/stags | 231 | 0 | ----- | 0 | 0 | ----- | 287 | 1 | 1 ivermectin |
| Bulls | 250 | 0 | ----- | 137 | 1 | 1 ivermectin | 272 | 1 | 1 moxidectin |
| Dairy cows | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Formula fed veal | 267 | 0 | ----- | 250 | 0 | ----- | 0 | 0 | ----- |
| Goats | 187 | 6 | 5 moxidectin<br>1 ivermectin | 86 | 1 | 1 ivermectin | 227 | 0 | ----- |
| Heavy calves | 89 | 0 | ----- | 81 | 0 | ----- | 117 | 1 | ----- |
| Heifers | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Horses | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Lambs | 0 | 0 | ----- | 188 | 0 | ----- | 287 | 0 | ----- |
| Market hogs | 0 | 0 | ----- | 216 | 0 | ----- | 0 | 0 | ----- |
| Mature sheep | 0 | 0 | ----- | 154 | 0 | ----- | 213 | 0 | ----- |
| Non-formula-fed | 76 | 0 | ----- | 84 | 0 | ----- | 99 | 0 | ----- |
| Rabbits | 0 | 0 | ----- | 0 | 0 | ----- | 58 | 0 | ----- |
| Sows | 0 | 0 | ----- | 0 | 0 | ----- | 311 | 0 | ----- |
| Steers | 211 | 0 | ----- | 221 | 0 | ----- | 0 | 0 | ----- |

***beta*-Agonists (clenbuterol, salbutamol, cimaterol, ractopamine, and zilpaterol)**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Beef cows | 324 | 0 | 0 | 0 | 0 | 0 |
| Bulls | 308 | 0 | 0 | 0 | 0 | 0 |
| Bob veal | 0 | 0 | 0 | 0 | 0 | 0 |
| Formula-fed veal | 0 | 0 | 0 | 0 | 0 | 0 |
| Goats | 73 | 0 | 49 | 0 | 221 | 0 |
| Heifers | 0 | 0 | 0 | 0 | 0 | 0 |
| Market hogs | 1 | 0 | 0 | 0 | 310 | 0 |
| Non-formula-fed veal | 0 | 0 | 153 | 0 | 111 | 0 |
| Steers | 134 | 0 | 170 | 0 | 0 | 0 |

**Carbadox**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Market hogs | 200 | 0 | 193 | 0 | 305 | 1 |
| Roaster pigs | 242 | 0 | 179 | 2 | 267 | 3 |

**Chloramphenicol**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Bob veal | 230 | 0 | 247 | 0 | 311 | 0 |
| Dairy cows | 306 | 0 | 281 | 0 | 0 | 0 |
| Formula-fed veal | 268 | 0 | 0 | 0 | 0 | 0 |
| Heifers | 0 | 0 | 0 | 0 | 298 | 0 |
| Mature chickens | 0 | 0 | 0 | 0 | 332 | 0 |
| Mature turkeys | 0 | 0 | 266 | 0 | 330 | 0 |
| Non-formula-fed veal | 0 | 0 | 0 | 0 | 0 | 0 |
| Steers | 280 | 0 | 264 | 0 | 317 | 0 |
| Young chickens | 25 | 0 | 311 | 0 | 0 | 0 |
| Young turkeys | 0 | 0 | 0 | 0 | 0 | 0 |

**Chlorinated hydrocarbons, Chlorinated organophosphates, Organophosphates, Pyrethroids, Environmental contaminants**

| Production Class | CY 2010 | | | CY 2009 | | | CY 2008 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Specific Violations | Number of Analyses | Number of Violations | Specific Violations | Number of Analyses | Number of Violations | Specific Violations |
| Beef cows | 0 | 0 | ----- | 0 | 0 | ----- | 282 | 0 | ----- |
| Boars/Stags | 231 | 2 | 1 PBDE<br>1 Halowax | 128 | 0 | ----- | 236 | 2 | 1 hexachloro benzene,<br>1 mirex |
| Bulls | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Dairy cows | 0 | 0 | ----- | 0 | 0 | ----- | 302 | 0 | ----- |
| Egg products | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Formula-fed | 208 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Goats | 0 | 0 | ----- | 95 | 0 | ----- | 214 | 0 | ----- |
| Heavy calves | 0 | 0 | ----- | 0 | 0 | ----- | 117 | 0 | ----- |
| Heifers | 0 | 0 | ----- | 0 | 0 | ----- | 277 | 0 | ----- |
| Horses | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |

| Production Class | CY 2010 | | | CY 2009 | | | CY 2008 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Specific Violations | Number of Analyses | Number of Violations | Specific Violations | Number of Analyses | Number of Violations | Specific Violations |
| Lambs | 0 | 0 | ----- | 117 | 0 | ----- | 276 | 0 | ----- |
| Market hogs | 263 | 0 | ----- | 302 | 0 | ----- | 0 | 0 | ----- |
| Mature chickens | 205 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Mature sheep | 0 | 0 | ----- | 88 | 0 | ----- | 197 | 0 | ----- |
| Mature turkeys | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Non-formula-fed veal | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Roaster pigs | 275 | 0 | ----- | 269 | 1 | 1 PBDE | 0 | 0 | ----- |
| Sows | 208 | 1 | 1 PBDE | 0 | 0 | ----- | 228 | 0 | ----- |
| Steers | 259 | 1 | 1 PBDE | 269 | 0 | ----- | 0 | 0 | ----- |
| Young chickens | 255 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |
| Young turkeys | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ----- |

**Florfenicol**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Beef cows | 0 | 0 | 1 | 0 | 206 | 0 |
| Bob veal | 0 | 0 | 116 | 1 | 0 | 0 |
| Dairy cows | 197 | 1 | 207 | 0 | 0 | 0 |
| Formula-fed veal | 0 | 0 | 0 | 0 | 0 | 0 |
| Mature chickens | 0 | 0 | 0 | 0 | 266 | 0 |
| Non-formula fed veal | 99 | 0 | 102 | 3 | 63 | 0 |
| Steers | 242 | 0 | 0 | 0 | 0 | 0 |

**Flunixin**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Beef cows | 310 | 1 | 216 | 0 | 0 | 0 |
| Bob veal | 200 | 1 | 0 | 0 | 0 | 0 |
| Bulls | 294 | 0 | 0 | 0 | 84 | 0 |
| Dairy cows | 296 | 0 | 231 | 0 | 90 | 0 |
| Heavy calves | 0 | 0 | 132 | 0 | 0 | 0 |

**Nitrofurans**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Dairy cows | 0 | 0 | 214 | 1 | 1 furazolidone | 237 |
| Formula-fed veal | 0 | 0 | 0 | 0 | 0 | 0 |
| Heifers | 0 | 0 | 0 | 0 | 0 | 0 |
| Market hogs | 526 | 0 | 221 | 0 | 0 | 303 |
| Roaster pigs | 0 | 0 | 0 | 0 | 0 | 0 |
| Steers | 0 | 0 | 0 | 0 | 0 | 0 |
| Sows | 616 | 0 | 209 | 0 | 0 | 295 |

**Nitroimidazoles**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Young chickens | 288 | 0 | 316 | 0 | 293 | 0 |
| Young turkeys | 0 | 0 | 317 | 0 | 0 | 0 |

**Sulfonamides**

| Production Class | CY 2010 | | | CY 2009 | | | CY 2008 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Specific sulfonamides Violations | Number of Analyses | Number of Violations | Specific sulfonamides Violations | Number of Analyses | Number of Violations | Specific sulfonamides Violations |
| Beef cows | 293 | 0 | ----- | 234 | 1 | 1 sulfadimethoxine | 0 | 0 | ------ |
| Boars/Stags | 232 | 1 | ----- | 0 | 0 | ----- | 0 | 0 | ------ |
| Bob veal | 194 | 0 | ----- | 90 | 0 | ----- | 254 | 1 | 1 sulfamethoxine |
| Bulls | 304 | 1 | ----- | 179 | 1 | 1 sulfamethazine | 0 | 0 | ------ |
| Dairy cows | 247 | 0 | ----- | 116 | 0 | ----- | 224 | 0 | ------ |
| Ducks | 0 | 0 | ----- | 240 | 0 | ----- | 0 | 0 | ------ |
| Egg products | 239 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ------ |
| Formula-fed veal | 211 | 0 | ----- | 247 | 1 | 1 sulfadimethoxine | 0 | 0 | ------ |
| Goats | 0 | 0 | ----- | 0 | 0 | ---- | 233 | 0 | ------ |
| Heavy calves | 88 | 0 | ----- | 53 | 1 | 1 sulfadimethoxine | 122 | 1 | 1 sulfamethazine |
| Heifers | 193 | 0 | ----- | 187 | 0 | ----- | 306 | 1 | 1 sulfamethazine |
| Lambs | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ------ |
| Market hogs | 211 | 2 | ----- | 101 | 1 | 1 sulfamethazine | 223 | 2 | 1 sulfamethazine |
| Mature chickens | 306 | 0 | ----- | 262 | 0 | ----- | 334 | 0 | ------ |
| Mature sheep | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ------ |
| Mature turkeys | 0 | 0 | ----- | 0 | 0 | ----- | 0 | 0 | ------ |
| Non-formula-fed veal | 76 | 0 | ----- | 85 | 0 | ----- | 104 | 1 | 1 sulfamethazine |
| Roaster pigs | 136 | 0 | ----- | 99 | 1 | 1 sulfamethazine | 230 | 0 | ------ |
| Sows | 250 | 0 | ----- | 0 | 0 | ----- | 314 | 2 | 1 sulfamethazine |
| Steers | 211 | 0 | ----- | 170 | 0 | ----- | 252 | 0 | ------ |
| Young chickens | 0 | 0 | ----- | 248 | 0 | ----- | 294 | 0 | ------ |
| Young turkeys | 0 | 0 | ----- | 185 | 0 | ----- | 0 | 0 | ------ |

**Thyreostats**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Beef cows | 0 | 0 | 216 | 0 | 313 | 0 |
| Dairy cows | 0 | 0 | 0 | 0 | 0 | 0 |
| Sow | 403 | 0 | 0 | 0 | 0 | 0 |
| Formula-fed veal | 0 | 0 | 0 | 0 | 0 | 0 |

**Trenbolone**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Formula-fed veal | 271 | 0 | 246 | 0 | 93 | 0 |
| Non-formula fed | 0 | 0 | 202 | 0 | 97 | 0 |

**Zeranol**

| Production Class | CY 2010 | | CY 2009 | | CY 2008 | |
|---|---|---|---|---|---|---|
| | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations | Number of Analyses | Number of Violations |
| Formula-fed veal | 94 | 0 | 80 | 0 | 94 | 0 |
| Non-formula-fed veal | 0 | 0 | 66 | 0 | 97 | 0 |